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GLOBAL DATA MONITORING REPORT

January, 1998

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CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

3. Composite Observing Systems for the North Atlantic (COSNA)

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11

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NOTE.

This report only covers the period 1st - 27th

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS $\geq$ 20 , and one or more of the following:

1.| bias|	$\geq$ 4 hPa	(pressure),
	$\geq$ 5 m s^{-1}	(wind speed),
	$\geq$ 30 degrees	(direction).
2.SD	$\geq$ 6 hPa	(pressure),
	$\geq$ 80 degrees	(direction).
3.PGE	$\geq$ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
C6FA6	ALL	MSLP	SUR	27	1	4	1.3	-7.2	7.3
DOWVD2D	ALL	MSLP	SUR	31	0	0	1.3	6.1	6.3
DUWH	ALL	MSLP	SUR	25	0	0	1.8	-4.3	4.7
ELSU8	ALL	MSLP	SUR	39	0	0	2.0	9.6	9.8
ELTE6	ALL	MSLP	SUR	25	0	0	0.7	-4.4	4.4
J8EL6	ALL	MSLP	SUR	35	4	11	1.9	-6.1	6.4
MVQN8	ALL	MSLP	SUR	27	1	4	1.5	12.4	12.5
PFQE	ALL	MSLP	SUR	33	9	27	2.5	0.4	2.5
SFMN	ALL	MSLP	SUR	43	0	0	1.8	-4.1	4.5
UFYN	ALL	MSLP	SUR	22	11	50	2.8	-2.1	3.5
V2XO	ALL	MSLP	SUR	42	0	0	2.2	-5.6	6.1
V7AS7	ALL	MSLP	SUR	49	0	0	1.0	11.8	11.8
WAQ3521	ALL	MSLP	SUR	24	0	0	2.4	-4.2	4.9
WDZB	ALL	MSLP	SUR	96	0	0	1.3	-5.7	5.9
WFLH	ALL	MSLP	SUR	49	0	0	1.9	-4.3	4.7
XCKX	ALL	MSLP	SUR	22	0	0	1.0	-4.0	4.1
ZCAM9	ALL	MSLP	SUR	35	0	0	2.4	-4.2	4.8
3FGN3	ALL	MSLP	SUR	20	0	0	1.0	-6.4	6.5
3FKZ3	ALL	MSLP	SUR	39	0	0	1.1	4.4	4.5
3FMP6	ALL	MSLP	SUR	33	0	0	1.8	-4.0	4.4
3FTJ4	ALL	MSLP	SUR	22	1	5	1.1	11.6	11.7
3FUD4	ALL	MSLP	SUR	31	0	0	1.2	-4.4	4.6
62414	ALL	MSLP	SUR	48	0	0	2.5	-4.0	4.7
9VIH	ALL	MSLP	SUR	29	0	0	1.0	-6.4	6.5
WIND SPEED									
C6HQ5	ALL	SPEED	SUR	29	0	0	4.2	-6.6	7.8
C6MQ2	ALL	SPEED	SUR	40	0	0	4.2	5.1	6.7
DGCDFD	ALL	SPEED	SUR	21	2	10	7.8	6.1	9.9
DUXW	ALL	SPEED	SUR	23	0	0	3.9	5.0	6.4
DXQC	ALL	SPEED	SUR	34	0	0	2.9	5.1	5.9
ELRR5	ALL	SPEED	SUR	21	1	5	3.6	6.3	7.3
ELUU6	ALL	SPEED	SUR	23	0	0	3.3	5.5	6.4
JADY	ALL	SPEED	SUR	23	0	0	4.4	5.3	6.9
J8CV5	ALL	SPEED	SUR	31	1	3	5.4	10.7	12.0
LAHG2	ALL	SPEED	SUR	26	0	0	2.8	5.5	6.2
LAVX4	ALL	SPEED	SUR	20	0	0	2.1	5.4	5.8
LEQZ3	ALL	SPEED	SUR	25	2	8	3.7	8.3	9.1
PDMQ	ALL	SPEED	SUR	28	0	0	6.6	7.3	9.8
PDTP	ALL	SPEED	SUR	23	0	0	6.3	5.2	8.2
PGUP	ALL	SPEED	SUR	36	0	0	5.2	6.8	8.5
PJOX	ALL	SPEED	SUR	54	0	0	4.0	7.1	8.2
SKPE	ALL	SPEED	SUR	31	0	0	4.5	5.8	7.3
S6BO	ALL	SPEED	SUR	51	0	0	3.6	5.8	6.8
3FTR6	ALL	SPEED	SUR	31	1	3	4.6	5.0	6.8
4QVU	ALL	SPEED	SUR	32	0	0	1.8	-5.0	5.3
62107	ALL	SPEED	SUR	88	24	27	1.8	0.2	1.8
9VXB	ALL	SPEED	SUR	20	5	25	5.1	9.4	10.7
9WCR3	ALL	SPEED	SUR	41	0	0	3.9	6.7	7.7
WIND DIRECTION									
ELSA4	ALL	DIRN.	SUR	25	0	0	39.7	32.9	51.6
ELUU4	ALL	DIRN.	SUR	28	0	0	49.9	-39.0	63.3
SEDCO703	ALL	DIRN.	SUR	20	0	0	20.1	-30.6	36.6
42007	ALL	DIRN.	SUR	64	0	0	33.1	-30.4	45.0
42020	ALL	DIRN.	SUR	77	0	0	19.5	-31.3	36.9
46061	ALL	DIRN.	SUR	78	0	0	36.8	-31.5	48.5
46181	ALL	DIRN.	SUR	80	0	0	26.3	-44.2	51.4
51019	ALL	DIRN.	SUR	55	0	0	29.9	-38.8	49.0
51302	ALL	DIRN.	SUR	53	0	0	37.9	-39.2	54.6
51305	ALL	DIRN.	SUR	63	0	0	33.6	-34.6	48.3
52316	ALL	DIRN.	SUR	69	0	0	25.6	-34.3	42.9
62107	ALL	DIRN.	SUR	88	24	27	71.6	-31.6	78.3
62301	ALL	DIRN.	SUR	73	4	5	131.7	-3.3	131.8

AVAILABILITY – SHIP/SYNOP – JANUARY 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 15888

FIGURE 1

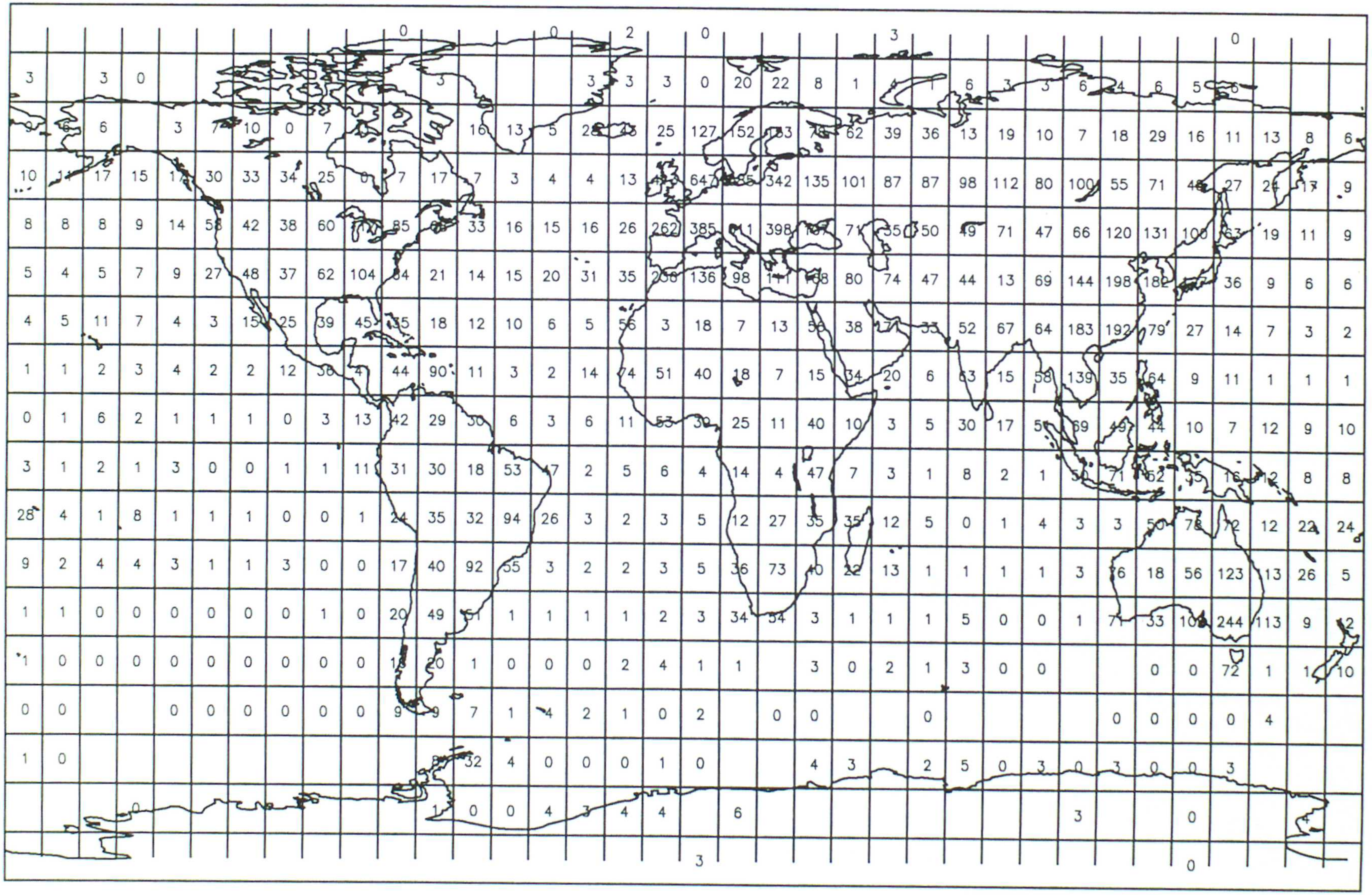


TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.| bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
23948	9.9	71.0	ALL	MSLP	SUR	57	23	40	0.7	-0.5	0.9
31527	-42.1	-24.3	ALL	MSLP	SUR	24	5	21	8.1	-0.8	8.1
33505	-46.5	-27.7	ALL	MSLP	SUR	28	24	86	2.6	-11.4	11.8
46905	39.3	-129.8	ALL	MSLP	SUR	88	88	100	0.0	0.0	0.0
WIND SPEED											
41505	20.4	-53.7	ALL	SPEED	SUR	131	0	0	2.6	-5.5	6.0
44609	51.4	-35.1	ALL	SPEED	SUR	560	113	20	8.5	5.0	9.9
62674	58.4	-29.0	ALL	SPEED	SUR	332	0	0	2.3	-5.5	5.9
62803	68.0	-61.8	ALL	SPEED	SUR	233	1	0	2.9	-7.3	7.9

AVAILABILITY – DRIFTER – JANUARY 1998
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 4764

FIGURE 2

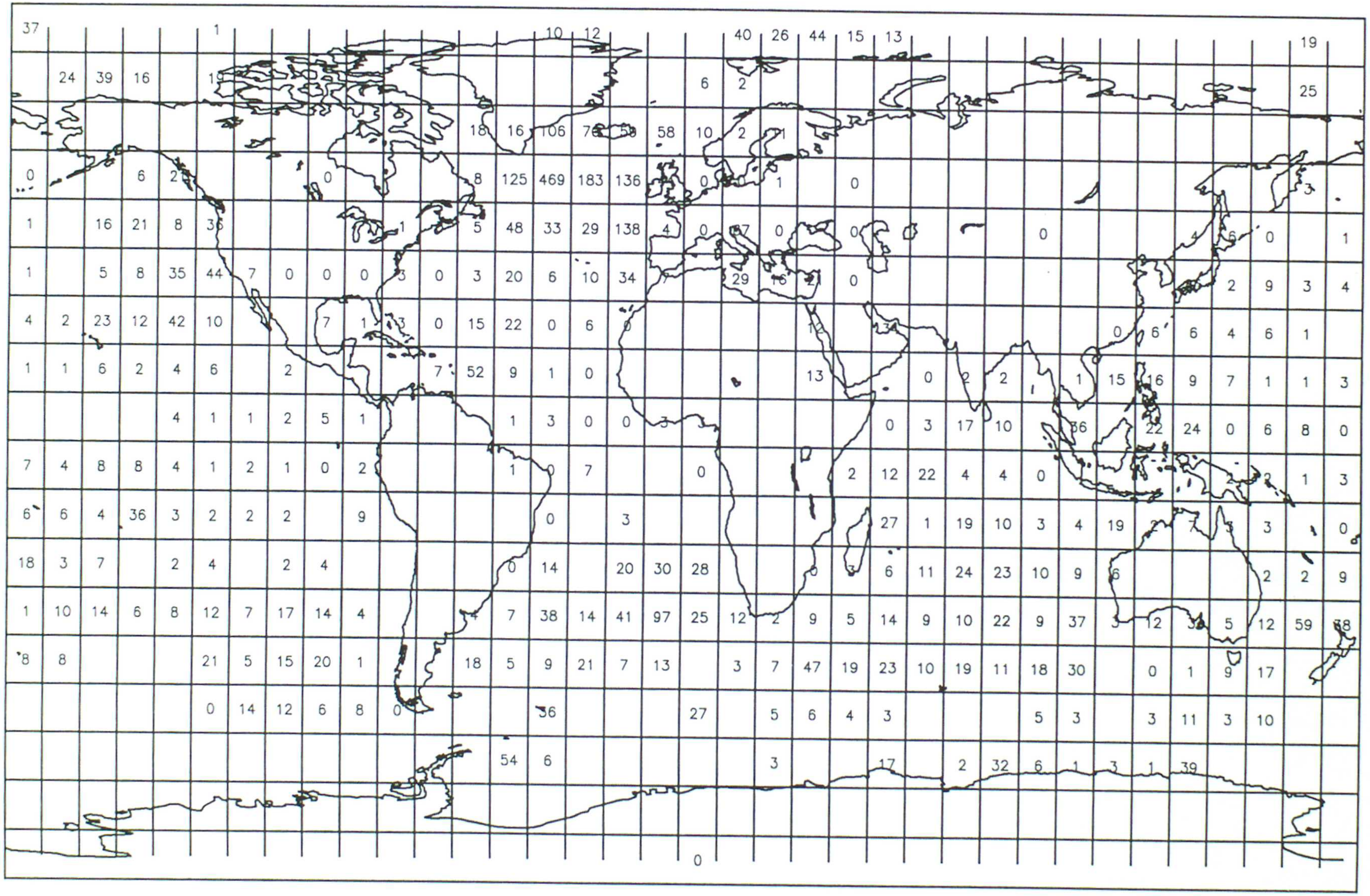

37 1 10 12 40 26 44 15 13 19
24 39 16 19 6 2 25
18 16 106 76 58 58 10 2 1
0 6 2 0 8 125 469 183 136 0 0 1 0 3
1 16 21 8 3 1 5 48 33 29 138 4 0 67 0 0 0 4 6 0 1
1 5 8 35 44 7 0 0 0 3 0 3 20 6 10 34 7 29 16 21 0 2 9 3 4
4 2 23 12 42 10 7 1 3 0 15 22 0 6 0 12 34 0 6 6 4 6 1
1 1 6 2 4 6 2 7 52 9 1 0 13 0 2 2 1 15 16 9 7 1 1 3
4 1 1 2 5 1 1 3 0 0 3 3 0 3 17 10 36 22 24 0 6 8 0
7 4 8 8 4 1 2 1 0 2 1 0 7 0 2 12 22 4 4 0 2 1 3
6 6 4 36 3 2 2 2 9 0 3 27 1 19 10 3 4 19 2 7 3 3 0
18 3 7 2 4 2 4 0 14 20 30 28 0 3 6 11 24 23 10 9 6 2 2 9
1 10 14 6 8 12 7 17 14 4 4 7 38 14 41 97 25 12 2 9 5 14 9 10 22 9 37 3 12 38 5 12 59 38
8 8 21 5 15 20 1 18 5 9 21 7 13 3 7 47 19 23 10 19 11 18 30 0 1 9 17
0 14 12 6 8 0 36 27 5 6 4 3 5 3 3 11 3 10
54 6 3 17 2 32 6 1 3 1 39
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	82	0	0	0	0.8	4.8	4.9
60468	35.6N	6.2E	1052	S8	78	78	100	0	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	84	84	100	0	0.0	0.0	0.0
60535	34.7N	3.3E	1144	S8	56	0	0	0	0.9	-6.4	6.5
60571	31.6N	2.2W	773	S8	78	0	0	0	0.9	-4.5	4.6
60670	24.6N	9.5E	1054	S8	80	1	1	64	0.9	8.9	8.9
63330	13.5N	39.5E	2212	MS	38	32	84	84	0.4	-5.4	5.4
63333	11.1N	39.7E	1916	MS	55	1	2	4	1.7	5.0	5.3
63334	10.4N	37.7E	2440	MS	52	0	0	85	3.3	8.8	9.4
63402	7.7N	36.8E	1577	MS	38	0	0	84	6.3	4.7	7.9
63471	9.6N	41.9E	1146	MS	52	1	2	85	5.0	9.4	10.6
63478	5.1N	44.6E	320	MS	36	0	0	0	0.9	7.7	7.8
68396	26.5S	31.3E	641	S8	40	0	0	0	0.9	5.0	5.1
68442	29.1S	26.3E	1359	S8	79	0	0	1	1.3	-4.3	4.5

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23383	66.9N	93.5E	278	MS	73	0	0	41	3.0	5.3	6.1
24382	66.4N	143.2E	196	MS	42	1	2	76	2.8	8.7	9.1
24671	63.9N	135.9E	402	MS	87	6	7	7	2.8	10.5	10.9
25703	62.9N	152.4E	205	MS	85	0	0	7	2.0	4.3	4.7
29956	52.8N	89.9E	455	MS	81	0	0	7	4.0	4.3	5.9
30253	57.9N	114.2E	275	MS	77	0	0	26	3.5	5.4	6.4
30320	56.9N	105.7E	669	MS	39	39	100	0	0.0	0.0	0.0
30549	54.2N	112.0E	1302	S8	43	2	5	33	1.6	-5.6	5.8
30554	54.5N	113.6E	995	MS	43	1	2	0	1.1	8.1	8.2
30627	53.1N	105.5E	762	MS	40	1	3	23	1.5	-5.0	5.2
30650	53.2N	112.8E	923	MS	42	0	0	2	1.8	-4.6	4.9
30664	53.5N	115.6E	811	MS	20	0	0	0	0.8	-5.6	5.7
30673	53.8N	119.7E	625	MS	44	0	0	25	1.2	-5.2	5.3
30713	52.8N	104.8E	526	MS	43	0	0	28	1.6	-4.3	4.6
30741	52.8N	110.0E	1286	S8	86	1	1	37	2.0	-4.8	5.2
30745	52.5N	111.6E	952	MS	44	0	0	2	2.1	-4.2	4.7
30758	52.1N	113.5E	671	MS	44	0	0	0	1.1	-4.3	4.4
30764	52.6N	115.2E	646	MS	43	1	2	0	1.0	-6.2	6.3
30777	52.2N	117.7E	525	MS	22	0	0	0	0.9	-4.7	4.8
30815	51.5N	103.6E	1442	S8	38	1	3	21	2.0	-4.6	5.0
30844	51.4N	110.5E	802	MS	44	1	2	0	1.3	-4.2	4.4
30925	50.4N	106.5E	797	MS	44	0	0	2	1.7	-4.2	4.5
30961	50.9N	115.6E	640	MS	42	0	0	0	1.5	-4.8	5.0
30965	50.4N	116.5E	676	MS	44	0	0	0	1.6	-4.1	4.4
30967	49.9N	115.8E	623	MS	43	0	0	0	1.8	-5.4	5.7
31123	57.8N	130.9E	255	MS	44	0	0	36	2.9	6.6	7.2
31263	54.7N	130.5E	464	M	79	0	0	23	2.9	4.2	5.1
31474	51.6N	133.3E	384	MS	88	0	0	40	3.4	6.7	7.5
31532	50.9N	132.3E	272	MS	82	1	1	52	2.2	5.8	6.2
36020	52.5N	80.2E	59	8	21	21	100	0	0.0	0.0	0.0
36058	51.4N	86.0E	420	MS	85	1	1	16	2.9	4.6	5.4
36428	49.2N	84.5E	401	MS	84	0	0	38	2.7	5.7	6.3
40701	39.3N	44.4E	1470	MS	74	0	0	0	1.1	8.5	8.6
40710	37.9N	47.5E	-9999	M	73	10	14	53	4.0	5.1	6.5
40743	36.2N	57.7E	941	MS	78	0	0	0	1.3	-4.4	4.6
40762	35.3N	59.2E	1333	MS	76	20	26	0	1.9	-13.2	13.3
40763	35.2N	58.5E	1060	MS	30	0	0	0	1.2	-4.8	4.9
40783	32.4N	49.7E	1972	MS	73	0	0	0	1.8	-7.0	7.2
40789	33.8N	55.1E	921	MS	62	0	0	0	1.3	9.6	9.7
40798	32.3N	50.9E	1991	MS	62	0	0	0	1.7	-8.0	8.2

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
40836	30.8N	51.7E	1880	MS	62	0	0	0	1.7	9.6	9.7
40859	29.0N	53.7E	1383	MS	65	1	2	0	1.3	10.3	10.4
41254	23.1N	57.7E	1755	S8	64	64	100	0	0.0	0.0	0.0
41515	35.6N	71.8E	1465	8	32	2	6	9	2.7	4.0	4.8
44212	50.0N	92.1E	939	MS	69	3	4	41	3.6	5.0	6.2
44239	48.8N	103.6E	1208	MS	67	1	1	22	1.8	-5.1	5.4
44275	46.8N	98.1E	2255	MS	69	1	1	25	2.0	-4.2	4.7
44416	28.6N	81.6E	720	MS	43	1	2	0	1.4	4.7	4.9
44477	27.0N	87.4E	1445	S8	39	39	100	0	0.0	0.0	0.0
51288	45.4N	90.5E	1651	S	88	0	0	42	1.7	-4.6	4.9
51334	44.6N	82.9E	321	M	87	15	17	21	2.4	9.9	10.2
51379	44.0N	89.6E	794	M	88	1	1	20	2.9	7.0	7.6
51818	37.6N	78.3E	1376	M	87	4	5	39	3.6	7.5	8.3
52378	41.4N	102.4E	960	M	87	0	0	29	1.9	4.5	4.9
52602	38.8N	93.4E	2734	S	88	0	0	0	1.7	-6.2	6.4
52866	36.6N	101.8E	2262	S	88	0	0	0	1.4	-4.0	4.2
53083	44.6N	114.2E	1183	M	87	0	0	62	2.7	4.9	5.6
53352	41.7N	110.4E	1377	M	86	0	0	71	3.0	6.3	7.0
53480	41.0N	113.1E	1416	M	88	0	0	33	2.8	4.4	5.2
53502	39.8N	105.8E	1033	M	87	0	0	28	2.2	4.2	4.7
53588	39.0N	113.5E	2898	S	87	0	0	37	2.3	-4.1	4.7
53705	37.5N	105.7E	1185	M	87	0	0	26	2.1	4.8	5.2
54386	41.4N	128.2E	1018	M	84	0	0	11	3.0	4.4	5.3
54587	39.1N	123.2E	-9999	M	72	0	0	4	2.1	-4.8	5.2
56021	34.1N	95.8E	4176	S	87	0	0	15	1.6	-4.8	5.1
56144	31.8N	98.6E	3185	S	78	0	0	1	2.5	-5.1	5.7
56287	30.0N	103.0E	629	M	88	0	0	38	2.0	5.3	5.7
56385	29.5N	103.3E	3049	S	88	0	0	2	1.9	-5.9	6.2
56444	28.5N	98.9E	3488	S	84	84	100	0	0.0	0.0	0.0
56462	29.0N	101.5E	2994	S	75	0	0	0	2.5	7.6	8.0
56838	24.0N	97.8E	776	M	87	0	0	1	1.6	4.0	4.3
56954	22.6N	99.9E	1054	M	88	0	0	32	1.9	4.8	5.2
57006	34.6N	105.8E	1143	M	88	0	0	9	2.4	4.7	5.3
58437	30.1N	118.2E	1836	S	87	0	0	6	1.6	-4.1	4.4
58445	30.3N	119.4E	1494	S	81	0	0	47	1.3	-5.8	5.9

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	S	27	0	0	0	0.9	-5.4	5.5
83214	10.3S	54.9W	285	MS	42	0	0	0	1.7	-6.2	6.4
83235	12.4S	46.4W	660	MS	62	0	0	0	1.1	6.5	6.6
83319	14.7S	52.4W	315	MS	52	0	0	0	1.4	-4.5	4.7
83332	14.1S	46.4W	950	MS	60	17	28	0	0.9	13.6	13.6
83408	14.3S	43.8W	556	MS	58	0	0	2	1.5	10.2	10.3
83423	16.7S	49.3W	729	MS	62	1	2	0	1.1	-5.2	5.3
83488	17.8S	42.9W	1097	MS	59	59	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	896	MS	61	2	3	0	1.1	-6.5	6.6
83587	19.9S	43.9W	850	MS	62	0	0	0	1.0	-7.0	7.1
83836	25.5S	50.6W	837	MS	59	0	0	0	1.2	-4.1	4.3
84401	5.2S	80.6W	55	MS	68	0	0	0	1.5	4.1	4.4
84425	5.9S	76.1W	184	MS	52	0	0	4	1.5	4.3	4.6
84455	6.5S	76.4W	282	MS	48	0	0	0	1.7	8.5	8.7
84472	7.1S	78.5W	2622	S	36	1	3	0	1.2	-6.1	6.2
84501	8.1S	79.0W	30	MS	69	0	0	0	1.5	4.2	4.5
84542	9.4S	77.6W	2760	S	29	1	3	3	1.9	4.2	4.6
84686	13.6S	72.0W	3249	S	79	0	0	0	1.8	-5.4	5.7
84782	18.1S	70.3W	469	MS	71	0	0	0	1.4	8.7	8.8
85141	14.5S	67.6W	202	MS	29	1	3	10	1.7	7.0	7.2

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
85312	19.8S	63.9W	992	S	21	3	14	0	1.5	-11.2	11.3
85406	18.3S	70.3W	58	M	88	0	0	2	1.7	6.6	6.8
85418	20.5S	70.2W	48	M	82	0	0	1	1.9	4.4	4.8
85442	23.4S	70.4W	135	M	88	0	0	2	1.4	6.1	6.3
85460	26.3S	70.6W	30	M	30	0	0	0	1.3	5.8	5.9
85470	27.3S	70.4W	291	M	60	1	2	2	1.6	4.8	5.1
85488	29.9S	71.2W	142	M	87	0	0	7	1.4	5.5	5.7

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71421	51.9N	63.3W	561	MS	85	0	0	47	1.7	-4.8	5.1
71891	50.2N	121.6W	229	MS	87	2	2	20	3.8	4.5	5.9
71909	63.8N	68.6W	34	MS	88	0	0	23	2.3	4.6	5.1
71967	61.4N	139.1W	801	MS	88	0	0	6	2.4	4.2	4.8
76539	22.1N	101.0W	1870	MS	39	0	0	0	0.9	-4.1	4.2
76632	20.1N	98.7W	2417	MS	21	0	0	100	0.7	-5.8	5.8
76634	20.1N	98.4W	2135	MS	30	1	3	83	1.0	-5.9	6.0
76750	18.5N	88.3W	9	MS	52	0	0	0	1.1	-4.4	4.5
76762	17.5N	99.5W	1865	MS	27	27	100	0	0.0	0.0	0.0
76845	16.7N	92.6W	2276	MS	41	41	100	0	0.0	0.0	0.0

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	MS	115	0	0	0	0.9	6.8	6.9
94955	41.6S	145.7E	684	MS	155	155	100	0	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	58	58	100	0	0.0	0.0	0.0
04416	72.6N	38.4W	3207	S	75	49	65	0	4.6	3.6	5.8
11180	47.7N	15.8E	1546	S8	82	0	0	13	1.5	-4.5	4.7
11231	46.6N	14.3E	476	MS	88	0	0	39	1.9	4.5	4.9
12510	50.7N	15.7E	1613	8	86	0	0	69	1.5	-4.1	4.4
16059	45.2N	7.7E	287	MS	81	0	0	15	2.3	4.0	4.6
16227	41.9N	13.6E	655	MS	83	83	100	0	0.0	0.0	0.0
16614	40.4N	21.3E	604	MS	75	0	0	12	1.0	-7.2	7.3

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	50	0	0	2	1.8	4.2	4.6
89345	89.7S	148.8W	620	S	73	29	40	0	2.6	-11.0	11.3
89744	74.0S	43.0E	3353	S	67	0	0	0	1.3	4.6	4.8

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:70.0 - 500.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	87	5	17	2.7	1.1	84	1	100	0	12.7	1.9
AAL	4347	0	1	1.8	0.3	4323	0	2	0	8.5	0.8
AAR	1368	1	2	2.1	-0.2	1320	0	3	0	9.5	0.6
ACA	1498	0	1	1.8	0.1	1493	0	2	0	7.2	1.0
ACI	37	3	5	1.1	0.2	36	0	6	0	7.9	1.2
AEA	486	0	100	2.2	0.0	479	0	7	0	9.1	1.0
AEL	630	0	3	1.8	-0.3	626	0	3	0	9.4	0.6
AEY	152	1	1	1.5	0.5	146	0	3	0	9.4	0.6
AFL	352	1	3	1.9	0.1	359	0	4	1	8.8	1.2
AFR	1617	1	11	1.9	0.3	1527	1	11	0	8.9	0.7
AIH	233	1	3	1.8	0.6	193	0	3	0	7.2	0.6
AJM	73	1	4	1.6	0.0	62	0	8	0	11.9	0.5
AMT	277	0	100	3.0	2.0	258	0	3	0	9.7	0.7
AMX	254	1	6	2.1	0.3	254	0	7	0	11.5	1.0
ANA	964	2	4	2.1	0.3	963	0	4	0	9.6	0.9
ANZ	1916	3	6	1.7	0.1	1844	0	4	1	7.7	1.1
AOM	762	3	5	1.7	0.7	695	0	5	0	9.2	0.4
ARP	74	0	0	2.0	1.3	74	0	0	0	8.1	2.2
AUA	45	0	7	1.8	-0.4	46	0	7	0	10.9	3.2
AVA	372	1	4	2.1	0.0	374	1	6	0	10.4	0.7
AVN	37	3	3	1.9	-0.8	36	0	0	0	6.6	-0.6
AZA	359	1	8	2.0	0.1	330	0	7	0	8.5	0.8
BAL	560	1	7	1.8	-0.2	561	1	8	0	7.9	1.1
BAW	1352	0	9	1.9	0.2	1304	0	10	0	8.2	1.4
BBB	49	0	0	1.2	-0.1	49	0	2	0	9.5	-0.7
BBC	22	5	5	1.8	1.1	22	5	9	0	8.1	0.8
BWA	329	1	100	2.0	1.1	323	0	5	0	10.4	0.7
CAL	1414	1	2	2.1	-0.2	1422	0	3	0	9.7	1.0
CCA	150	2	10	3.2	0.5	151	3	99	0	14.5	0.4
CDN	1639	0	2	2.1	0.7	1624	0	4	1	9.1	0.7
CES	258	0	1	2.2	0.3	250	2	6	0	10.9	0.1
CFG	1048	0	2	1.9	-0.5	1047	0	3	0	9.3	0.6
CKS	176	1	66	3.1	1.8	158	0	2	0	9.1	0.8
CKT	206	1	3	1.5	0.3	202	0	6	0	8.5	-0.1
CLX	247	1	1	1.8	-0.2	255	0	4	0	8.2	1.0
CMI	474	1	1	1.8	1.1	475	0	2	0	8.1	-0.1
CMM	435	0	2	2.1	0.3	408	0	4	0	10.8	1.0
COA	1160	0	3	2.0	0.6	1169	1	7	0	11.5	2.3
CPA	76	0	0	1.4	-0.2	75	0	1	0	8.8	0.1
CRL	712	1	3	1.6	0.2	680	1	4	0	9.1	0.4
CSN	69	3	1	2.3	0.2	70	0	4	0	12.5	1.6
CTB	193	1	2	1.6	0.1	196	1	2	0	6.9	1.4
CTM	38	8	21	1.7	-0.4	39	0	23	0	13.7	0.6
CUB	397	0	5	2.4	1.4	381	1	100	0	10.4	1.9
DAL	4095	0	2	2.3	0.7	4112	0	2	0	8.4	0.7
DBY	134	1	4	1.9	-0.5	136	0	4	0	9.3	1.1
DHL	196	0	100	3.5	-2.1	195	0	100	1	10.7	1.3
DLH	2375	0	8	1.7	0.2	2370	0	11	3	7.2	0.9
DOA	33	0	0	1.4	-0.2	33	0	0	0	7.6	-0.3
EIA	119	2	8	1.8	0.3	113	0	7	0	11.5	0.1
ELY	122	2	8	1.9	0.1	120	0	9	1	8.0	0.8
EVA	1192	1	2	2.0	-0.3	1181	1	4	0	9.4	0.5
EWW	86	0	100	2.8	0.6	84	0	100	0	13.8	2.8
FDX	952	1	2	2.0	0.8	950	0	2	0	8.6	0.9
FFF	39	0	5	1.0	0.2	39	31	100	0	29.3	1.4
FIN	292	0	4	1.8	0.5	295	1	7	1	8.2	0.7
FJI	412	6	8	1.5	0.5	389	1	3	0	8.4	0.4
FOM	117	5	6	1.3	0.6	113	0	1	0	6.6	0.4
GAF	24	0	0	2.7	0.0	24	0	4	0	8.8	3.2

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GCO	38	0	8	2.2	1.6	38	0	8	0	7.9	-0.7
GHA	46	0	0	1.1	0.0	37	0	0	0	9.6	0.9
GIA	229	0	1	1.6	0.7	201	0	2	0	8.8	1.0
HAL	1494	1	2	2.1	0.5	1482	0	3	0	11.2	0.8
HLF	130	1	5	2.0	-0.4	130	0	4	0	7.8	1.0
HLQ	40	20	33	2.8	1.7	37	0	22	0	15.1	-1.4
HRH	92	15	24	1.9	1.1	78	0	12	0	9.1	1.4
IBE	1974	1	9	2.1	0.6	1977	1	10	0	9.9	0.9
ICE	630	0	1	1.7	0.1	620	0	2	1	6.0	0.3
JAL	5366	1	2	2.0	0.4	5357	0	2	0	9.0	1.0
JAZ	92	3	7	2.5	2.0	90	0	6	0	9.0	0.6
KAL	2754	1	2	2.1	-0.1	2680	0	3	0	9.8	1.1
KLM	2721	0	1	1.7	0.2	2714	0	2	0	7.8	0.8
LDA	253	1	10	1.7	-1.0	256	0	13	0	10.3	0.8
LDI	502	1	14	1.9	-0.2	503	0	16	0	8.9	0.1
LEI	197	1	1	1.6	0.3	194	1	3	0	8.5	1.4
LIB	399	1	2	1.7	0.7	396	1	4	0	9.5	-0.1
LOT	142	1	4	2.0	-1.1	143	0	2	0	7.5	1.5
LTU	702	1	2	1.6	0.2	705	0	3	0	8.3	1.0
MAS	254	0	2	2.1	-0.2	209	0	100	0	10.6	0.9
MDA	136	0	1	1.9	0.4	134	1	5	0	10.0	-0.6
MON	29	3	7	1.2	0.5	28	0	7	0	10.8	-0.7
MPD	123	1	1	2.2	1.1	120	1	4	0	9.7	0.3
MPH	818	1	2	1.8	-0.7	821	0	2	0	8.5	0.5
NCA	460	1	1	1.8	0.4	452	0	2	0	8.6	0.9
NWA	7909	1	2	2.1	0.7	7893	0	2	0	8.6	0.8
PAC	109	2	6	2.2	1.1	110	0	4	0	9.6	0.5
PAL	866	0	1	1.8	-0.3	831	0	2	0	10.1	0.5
PAO	250	1	7	1.6	0.2	247	0	7	1	6.4	0.2
QFA	1141	2	6	1.7	0.4	1129	0	6	1	8.2	1.2
RAF	144	1	1	1.5	0.5	144	0	1	0	8.7	0.6
RAM	57	4	4	2.2	-0.9	57	0	2	0	9.9	3.1
RCH	280	1	96	2.7	1.0	282	0	96	0	10.0	1.0
RJA	30	0	0	1.8	0.8	30	0	3	3	4.8	-0.9
RKA	120	1	2	1.7	-0.1	79	0	0	0	8.9	0.6
ROY	40	0	3	1.6	0.2	41	0	12	0	11.6	1.4
RRR	107	2	15	1.9	0.6	110	0	14	0	9.5	-0.7
SAA	159	1	3	1.7	-0.2	151	0	1	0	7.7	0.3
SAB	29	0	0	1.2	0.2	30	0	0	0	6.0	2.6
SAS	1004	0	1	1.8	0.1	1004	0	2	1	7.3	0.5
SCX	158	2	2	1.9	1.0	97	0	0	0	7.2	0.3
SIA	929	1	2	2.2	-0.6	902	0	3	0	9.2	0.2
SLR	117	0	11	1.6	-0.2	120	0	58	0	8.0	0.7
SOL	28	7	7	1.0	0.1	26	0	4	0	11.1	3.9
SPP	139	32	52	4.8	2.3	133	2	9	0	13.0	1.3
SVA	115	0	4	2.3	0.0	125	0	100	0	13.4	3.5
SVV	20	0	5	3.2	1.2	20	0	20	0	14.5	-1.0
SWR	110	0	3	1.8	0.3	114	0	5	1	8.0	1.8
TAP	466	0	3	1.8	-0.4	463	1	6	0	10.5	0.3
THA	338	0	1	2.0	-0.4	323	0	2	0	9.4	1.0
TOW	97	1	6	2.0	-0.3	95	0	9	0	10.9	1.8
TSC	28	0	7	1.8	0.4	24	0	4	0	5.5	-0.4
TWA	1321	0	3	2.0	0.1	1311	0	4	0	8.9	1.0
UAL	9076	1	4	2.2	0.1	9034	0	2	0	8.5	0.7
UNS	817	0	19	1.3	0.5	816	0	19	0	7.2	0.9
UPS	672	0	8	1.8	0.4	667	0	9	0	8.7	0.9
USA	194	0	0	1.9	0.2	195	0	6	0	13.3	2.2
VIR	237	0	0	1.9	-0.3	244	0	3	1	8.2	1.2
VKG	50	0	2	1.7	1.1	52	0	6	0	10.3	1.5

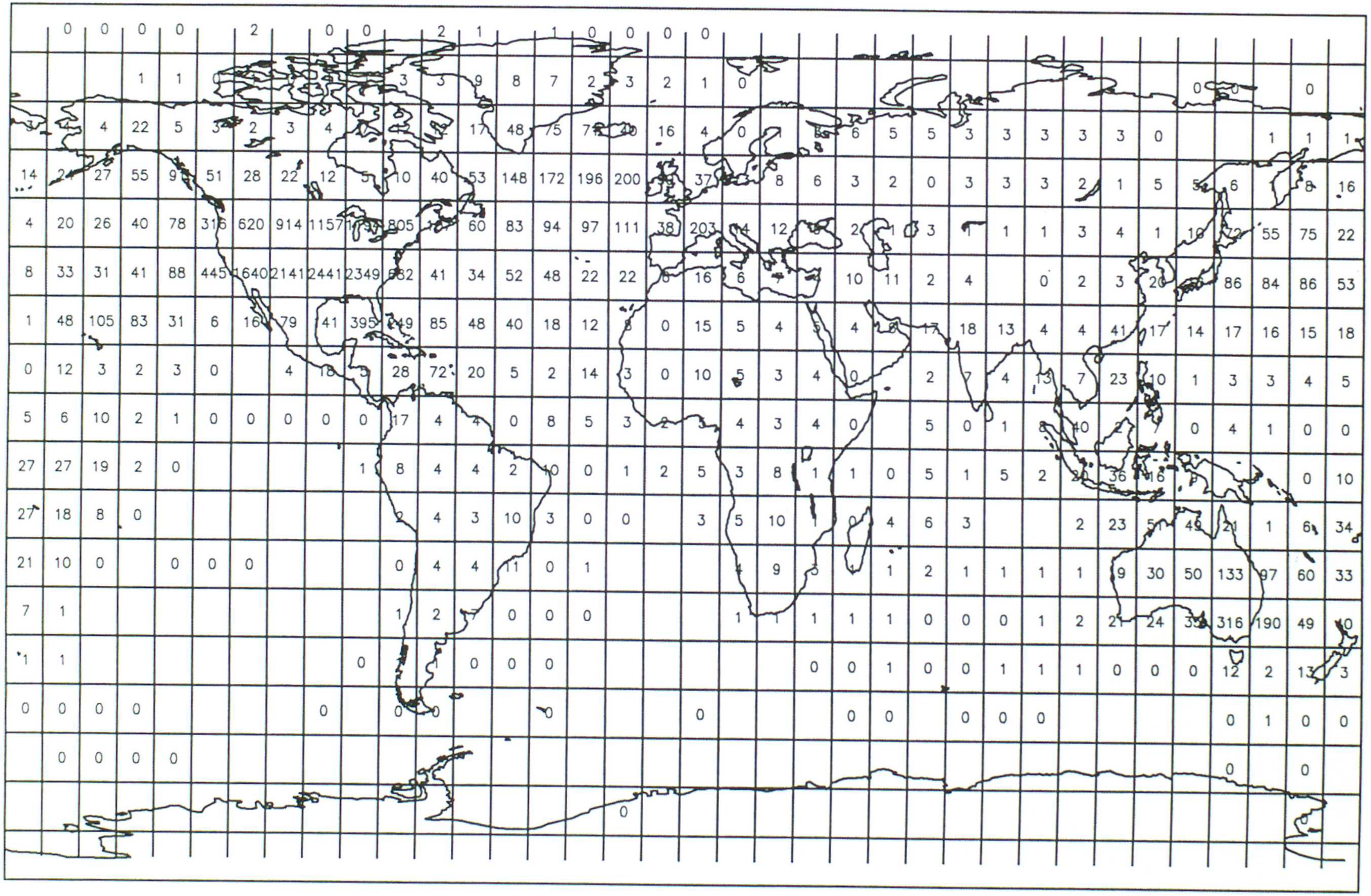
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
VRG	28	0	0	1.3	0.6	24	0	0	0	8.1	2.1
VSP	128	1	2	2.2	0.3	126	0	6	0	12.0	-0.1
WOA	85	1	4	1.8	0.3	88	1	2	0	8.1	2.2
AN	18656	1	2	1.5	0.1	18656	0	0	0	6.3	0.9
AR	2107	1	32	1.6	1.0	2104	0	32	0	8.1	1.3
BA	13842	0	1	1.3	0.3	13800	0	1	0	7.2	1.2
FJ	40	8	25	2.3	1.2	40	0	13	0	8.1	2.4
IT	379	0	1	1.2	-0.2	379	0	1	0	7.5	0.9
KL	9185	0	1	1.4	0.6	9181	0	1	0	6.9	0.6
LH	2706	0	1	1.4	0.3	2688	0	1	0	6.9	1.0
MK	1888	0	0	1.0	0.7	1873	0	0	0	7.3	1.6
QF	18651	0	0	1.0	0.3	18649	0	0	1	6.3	1.2
SA	1770	0	0	1.6	1.2	1770	0	0	0	7.5	0.8
SV	576	0	0	1.0	0.6	578	0	0	0	7.0	0.0
N	513	1	4	2.6	0.8	396	0	3	0	10.0	0.8
ADS	587	0	0	1.0	-0.2	587	0	47	0	6.4	1.0
US ACARS	423319	0	2	1.6	0.2	422720	0	2	0	7.1	1.0

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA

FIGURE 3

JANUARY 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED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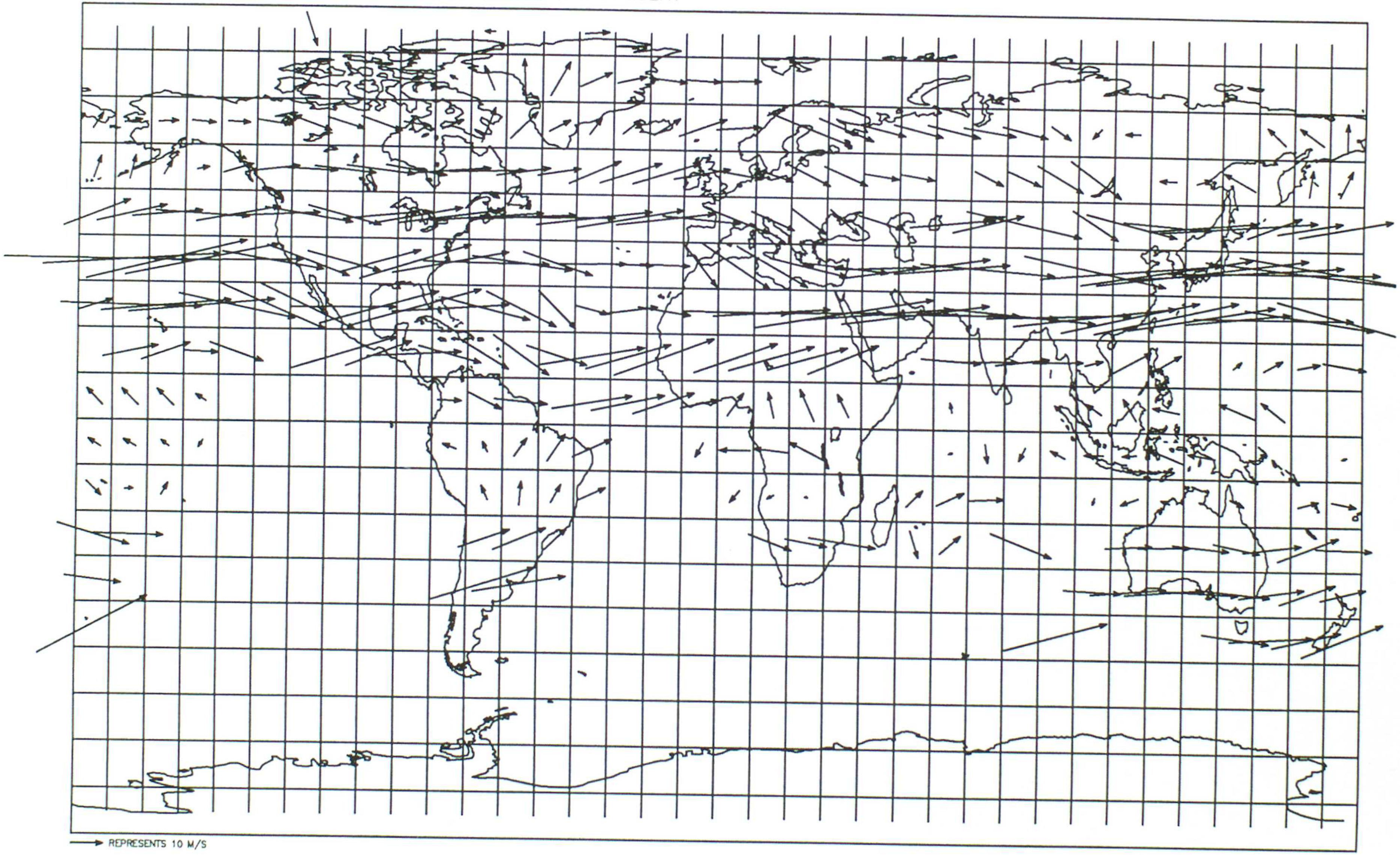
1 1 0 3 3 9 8 7 2 3 2 1 0 0 0 0
3 4 4 22 5 3 2 3 4 12 12 17 48 75 71 40 16 4 0 1 6 5 5 3 3 3 3 3 0 1 1 1
14 24 27 55 9 51 28 22 12 5 10 40 53 148 172 196 200 33 37 8 6 3 2 0 3 3 3 2 1 5 5 6 8 16
4 20 26 40 78 316 620 914 1157 805 60 83 94 97 111 38 203 14 12 2 1 3 1 1 1 3 4 1 16 72 55 75 22
8 33 31 41 88 445 1640 2141 2441 2349 682 41 34 52 48 22 22 6 16 6 7 10 11 2 4 0 2 3 20 86 84 86 53
1 48 105 83 31 6 16 79 41 395 249 85 48 40 18 12 8 0 15 5 4 5 4 6 17 18 13 4 4 41 17 14 17 16 15 18
0 12 3 2 3 0 4 18 5 28 72 20 5 2 14 3 0 10 5 3 4 0 2 7 4 13 7 23 10 1 3 3 4 5
5 6 10 2 1 0 0 0 0 0 17 4 4 0 8 5 3 2 3 4 3 4 0 5 0 1 8 40 2 7 0 4 1 0 0
27 27 19 2 0 1 8 4 4 2 10 0 1 2 5 3 8 1 1 0 5 1 5 2 20 36 16 0 10
27 18 8 0 2 4 3 10 3 0 0 3 5 10 1 0 4 6 3 2 23 51 49 21 1 6 34
21 10 0 0 0 0 0 4 4 11 0 1 4 9 3 1 1 2 1 1 1 1 9 30 50 133 97 60 33
7 1 1 2 7 0 0 0 1 1 1 1 1 0 0 0 1 2 21 24 33 316 190 49 10
1 1 0 1 0 0 0 0 0 1 0 0 1 1 1 0 0 0 12 2 13 3
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0
0 0

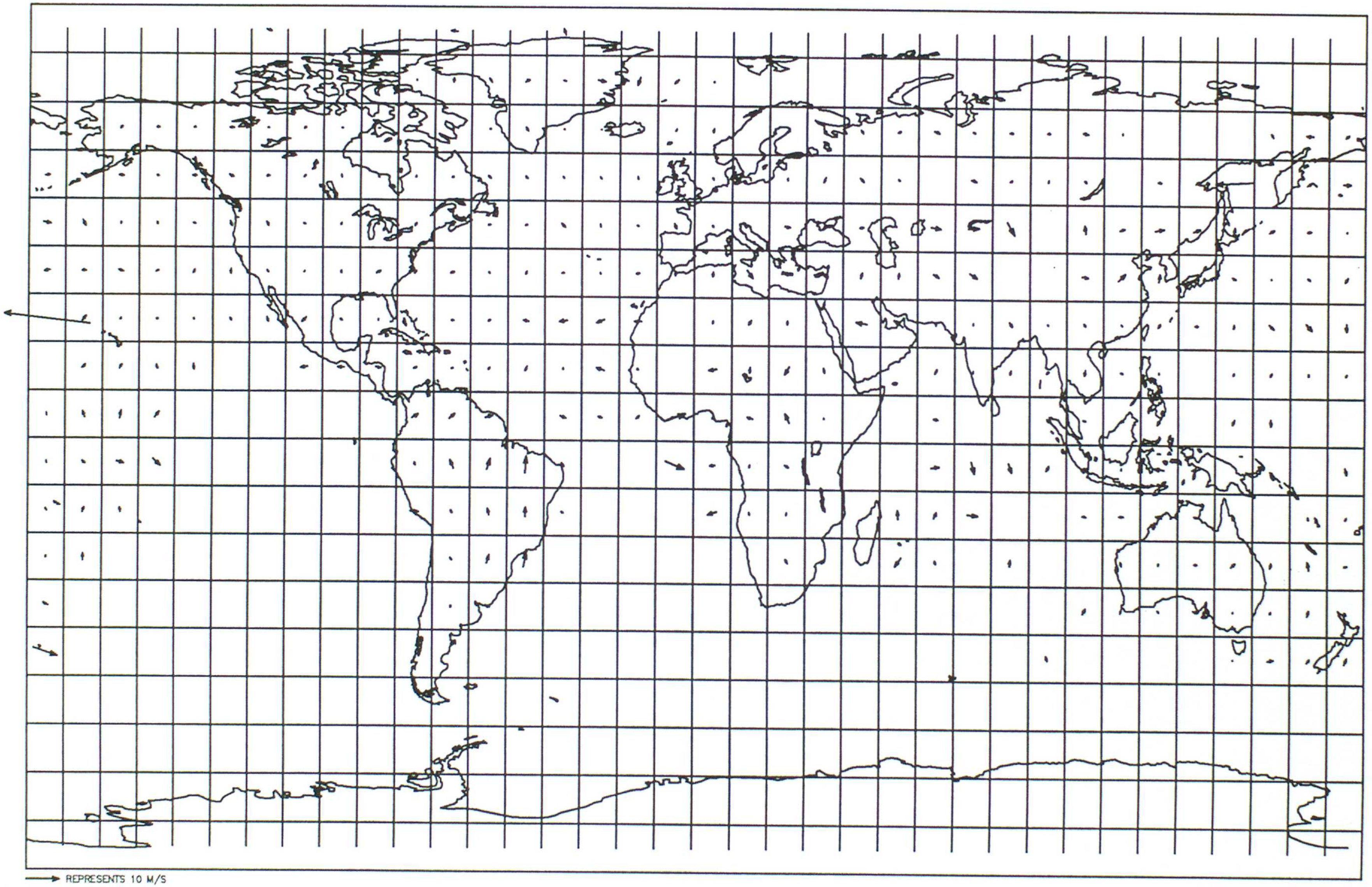
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA
JANUARY 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4

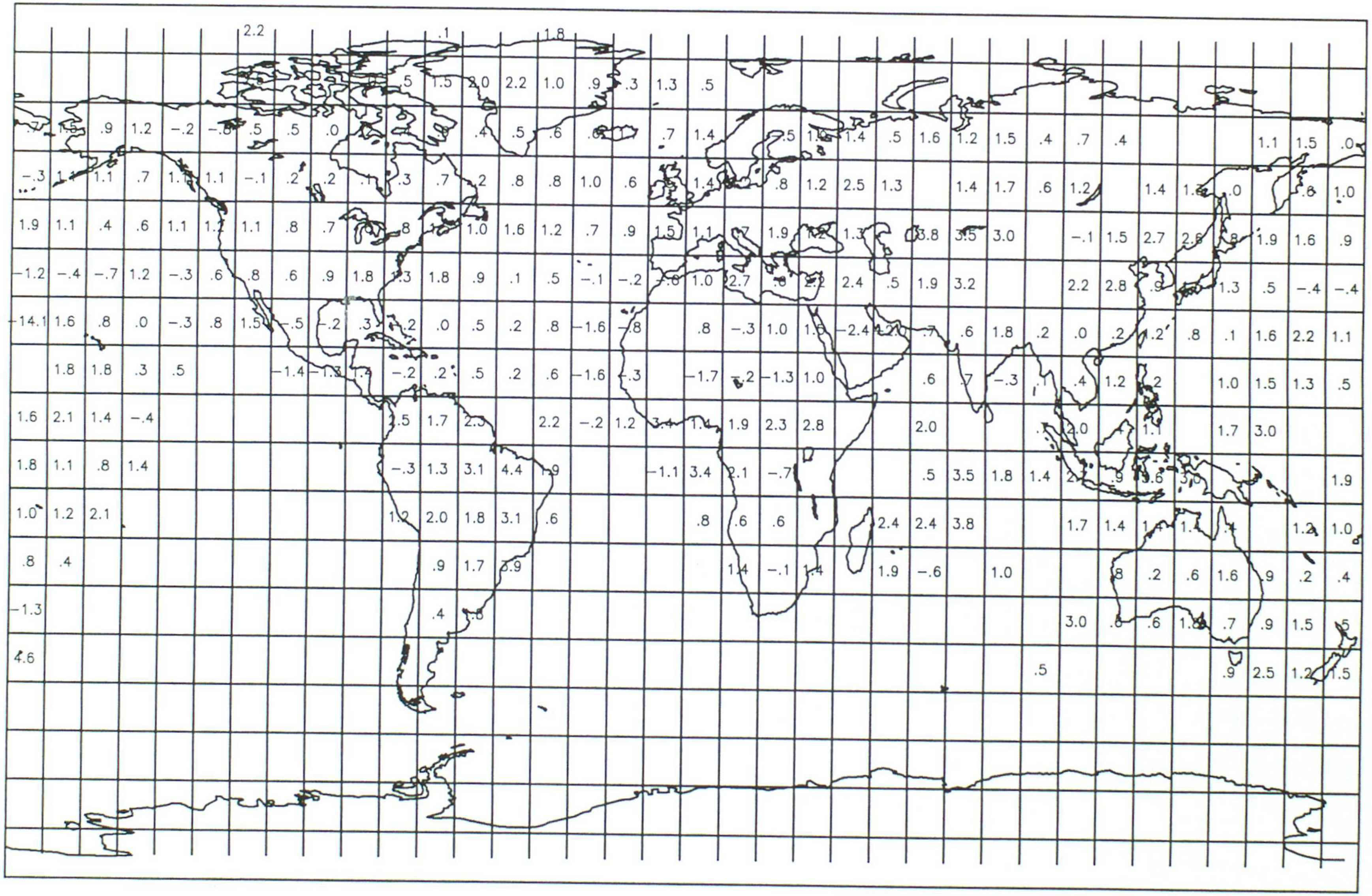


AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA
JANUARY 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 5



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JANUARY 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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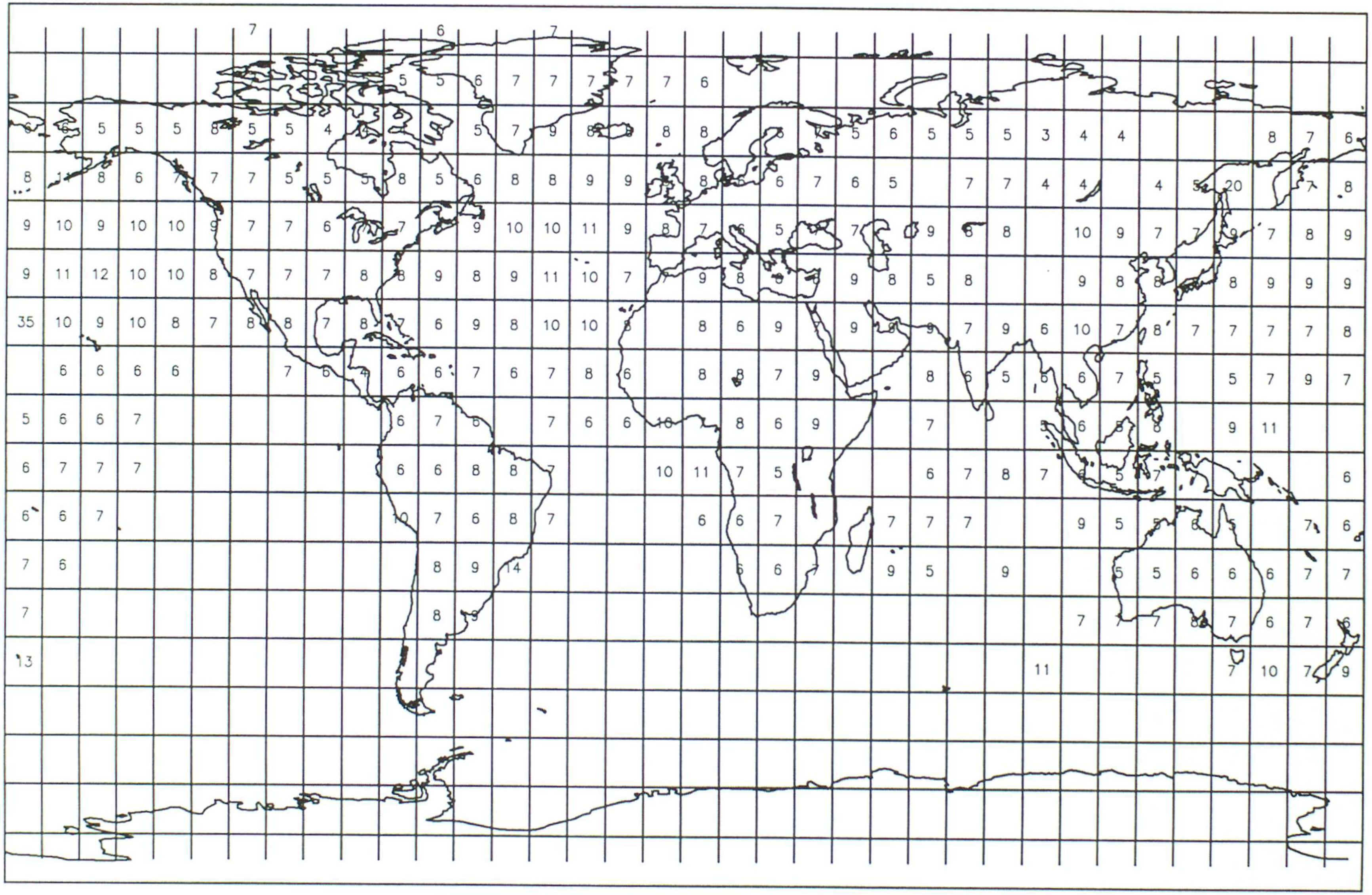
.5 1.5 2.0 2.2 1.0 .9 .3 1.3 .5
.7 1.5 .9 1.2 –.2 –.8 .5 .5 .0 .7 .8 .4 .5 .6 .6 .7 1.4 .5 1.0 1.4 .5 1.6 1.2 1.5 .4 .7 .4 1.1 1.5 .0
–.3 1.4 1.1 .7 1.1 1.1 –.1 .2 .2 .1 .3 .7 .2 .8 .8 1.0 .6 1.4 .8 1.2 2.5 1.3 1.4 1.7 .6 1.2 1.4 1.6 .0 .8 1.0
1.9 1.1 .4 .6 1.1 1.2 1.1 .8 .7 .8 1.0 1.6 1.2 .7 .9 1.5 1.1 .7 1.9 1.2 1.3 3.8 3.5 3.0 –.1 1.5 2.7 2.6 .8 1.9 1.6 .9
–1.2 –.4 –.7 1.2 –.3 .6 .8 .6 .9 1.8 1.3 1.8 .9 .1 .5 –.1 –.2 –.8 1.0 2.7 .8 2.2 2.4 .5 1.9 3.2 2.2 2.8 .9 1.3 .5 –.4 –.4
–14.1 1.6 .8 .0 –.3 .8 1.5 –.5 –.2 .3 .2 .0 .5 .2 .8 –1.6 .8 .8 –.3 1.0 1.5 –2.4 2.0 .7 .6 1.8 .2 .0 .2 1.2 .8 .1 1.6 2.2 1.1
1.8 1.8 .3 .5 –1.4 –1.3 1.4 –.2 .2 .5 .2 .6 –1.6 –.3 –1.7 .2 –1.3 1.0 .6 .7 –.3 .4 1.2 .2 1.0 1.5 1.3 .5
1.6 2.1 1.4 –.4 .5 1.7 2.3 2.2 –.2 1.2 3.4 1.4 1.9 2.3 2.8 2.0 .7 2.0 1.1 1.7 3.0
1.8 1.1 .8 1.4 –.3 1.3 3.1 4.4 1.9 –1.1 3.4 2.1 –.7 .5 3.5 1.8 1.4 2.2 .9 3.6 3.0 1.9
1.0 1.2 2.1 1.2 2.0 1.8 3.1 .6 .8 .6 .6 2.4 2.4 3.8 1.7 1.4 1.4 1.4 1.4 1.2 1.0
.8 .4 .9 1.7 3.9 1.4 –.1 1.4 1.9 –.6 1.0 .8 .2 .6 1.6 .9 .2 .4
–1.3 .4 1.8 3.0 .6 .6 1.8 .7 .9 1.5 .5
4.6 .5 .9 2.5 1.2 1.5

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
JANUARY 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


7 6 7
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6 6 5 5 5 8 5 5 4 6 4 5 7 9 8 8 8 8 5 6 5 5 5 3 4 4 8 7 6
8 11 8 6 7 7 7 5 5 5 8 5 6 8 8 9 9 8 8 6 7 6 5 7 7 4 4 4 5 20 7 8
9 10 9 10 10 9 7 7 6 7 9 10 10 11 9 8 7 6 5 7 9 8 8 10 9 7 7 9 7 8 9
9 11 12 10 10 8 7 7 7 8 8 9 8 9 11 10 7 7 9 8 8 8 9 8 5 8 9 8 8 8 9 9 9
35 10 9 10 8 7 8 8 7 8 7 6 9 8 10 10 8 8 6 9 7 9 9 9 7 9 6 10 7 8 7 7 7 7 8
6 6 6 6 7 6 4 6 6 7 6 7 8 6 8 8 7 9 8 6 5 6 6 7 5 5 7 9 7
5 6 6 7 6 7 6 7 6 6 10 7 8 6 9 7 5 6 8 8 9 11
6 7 7 7 6 6 8 8 7 10 11 7 5 6 7 8 7 6 5 7 6
6 6 7 10 7 6 8 7 6 6 7 7 7 7 9 5 5 6 5 7 6
7 6 8 9 14 6 6 7 9 5 9 5 5 6 6 6 7 7
7 8 9 7 7 7 8 7 6 7 6
13 11 7 10 7 9

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

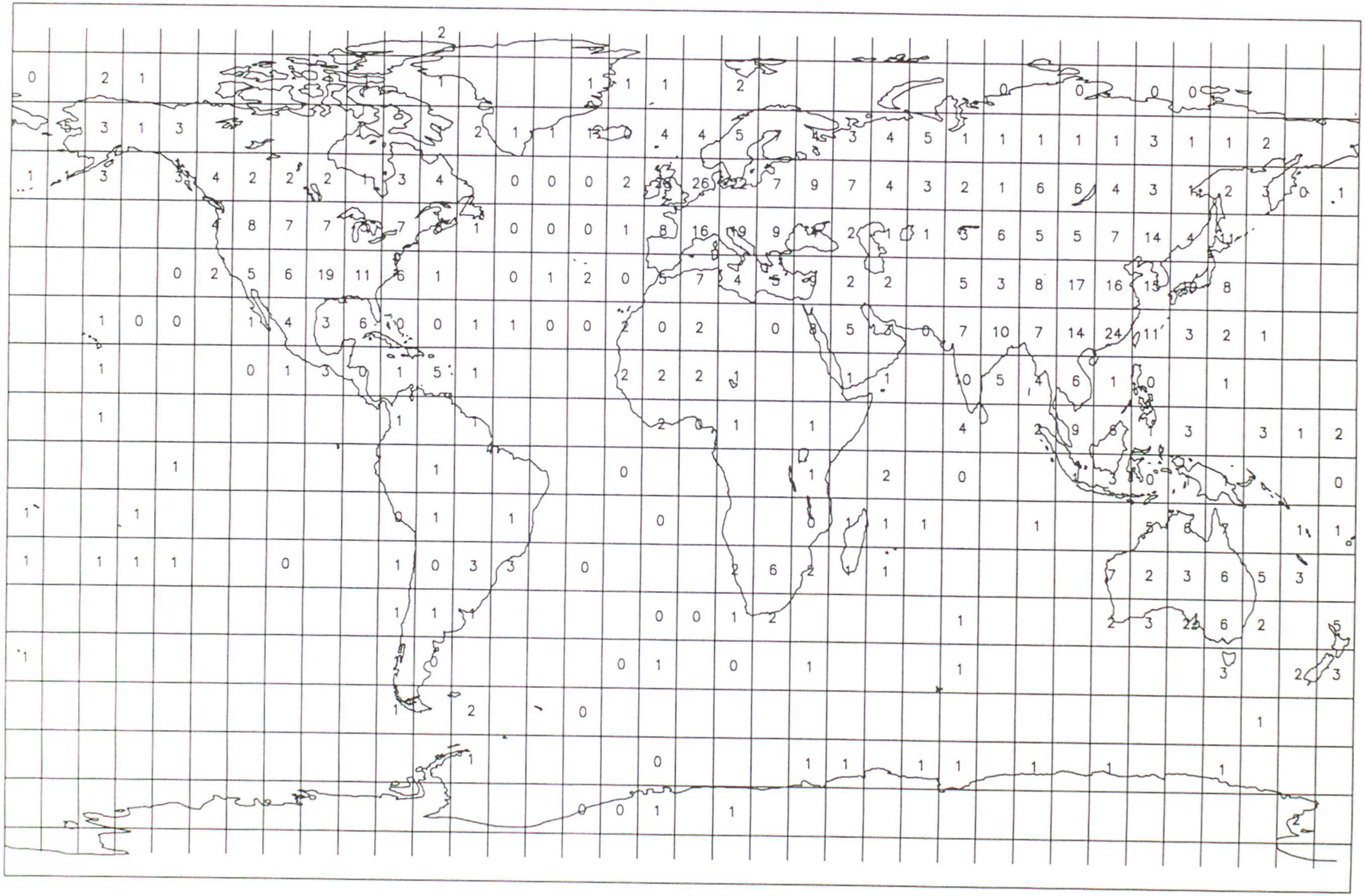
WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
CGDX	00	Z	300	75/-150	15	0	38.7	60.9	72.2	4
26258	00	Z	250	58/ 28	15	0	40.7	67.1	78.5	4
41217	12	Z	250	24/ 55	11	1	69.2	-105.1	125.8	6
42027	00	Z	200	34/ 75	15	0	71.6	-55.9	90.8	4
42027	12	Z	300	34/ 75	13	0	61.4	39.3	72.9	4
42101	00	Z	70	30/ 76	13	0	142.0	-24.8	144.2	6
42339	12	Z	70	26/ 73	10	0	133.4	128.7	185.4	6
42369	00	Z	150	27/ 81	15	1	100.3	-57.4	115.6	7
42369	12	Z	70	27/ 81	13	0	137.8	88.8	164.0	5
42647	00	Z	150	23/ 73	16	0	123.0	-19.0	124.4	7
42647	12	Z	150	23/ 73	12	0	72.4	109.2	131.0	7
42701	00	Z	70	23/ 85	15	0	118.8	47.3	127.8	5
42867	00	Z	70	21/ 79	13	0	139.8	47.6	147.7	4
43003	12	Z	70	19/ 73	10	1	64.5	163.0	175.3	7
43014	00	Z	150	20/ 75	15	1	66.2	-165.8	178.5	4
43128	12	Z	70	17/ 78	17	0	118.2	138.4	182.0	7
43192	00	Z	50	15/ 74	14	0	124.1	-142.7	189.1	8
43192	12	Z	250	15/ 74	20	0	73.0	38.9	82.7	5
43279	12	Z	70	13/ 80	10	0	73.5	218.8	230.8	6
43285	12	Z	100	13/ 75	12	0	79.1	158.4	177.1	7
43295	12	Z	250	13/ 78	11	0	68.3	99.5	120.7	5
43346	12	Z	200	11/ 80	19	0	80.5	66.6	104.5	6
43369	12	Z	30	8/ 73	10	1	99.2	271.1	288.7	8
43371	00	Z	50	8/ 77	17	0	93.5	-218.5	237.7	6
56739	12	Z	100	25/ 98	22	0	29.8	128.2	131.6	4
60360	12	Z	500	37/ 8	4	7	26.8	-108.8	112.0	8
60490	12	Z	150	36/ -1	9	3	95.9	-169.6	194.8	8
62414	12	Z	30	24/ 33	10	2	120.6	267.8	293.7	5
76458	00	Z	70	23/-106	11	0	27.1	131.5	134.3	4
82824	12	Z	30	-9/ -64	13	0	74.5	177.5	192.5	4
89022	12	Z	30	-75/ -27	12	0	34.6	198.6	201.6	4
89664	00	Z	50	-78/ 167	13	1	40.1	154.7	159.8	8
97560	12	Z	250	-1/ 136	19	0	39.6	-77.4	86.9	7

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – JANUARY 1998 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 927


2
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4 8 7 7 7 1 0 0 0 1 8 16 19 9 2 1 1 3 6 5 5 7 14 4 1
0 2 5 6 19 11 6 1 0 1 2 0 5 7 4 5 9 2 2 5 3 8 17 16 13 10 8
1 0 0 1 4 3 6 0 0 1 1 0 0 2 0 2 0 8 5 3 0 7 10 7 14 24 11 3 2 1
1 0 1 3 0 1 5 1 2 2 2 1 1 1 10 5 4 6 1 0 1
1 1 1 2 0 1 1 4 2 9 6 1 3 3 1 2
1 1 0 1 2 0 3 0 0
1 1 0 1 1 0 0 1 1 1 1 5 6 1 1
1 1 1 1 0 1 0 3 3 0 2 6 2 1 1 7 2 3 6 5 3
1 1 1 0 0 1 2 1 2 3 23 6 2 5
1 0 1 0 1 1 3 2 3
1 2 0 1
1 0 1 1 1 1 1 1 1
0 0 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
42369	00	V	100	27/ 81	12	0	8	2.4	-10.3	15.7	2
43014	00	V	250	20/ 75	11	0	27	14.5	4.3	17.7	1
43014	12	V	300	20/ 75	10	0	10	11.9	0.3	16.2	1
54497	00	V	100	40/ 124	15	0	20	10.3	2.1	17.5	1
56691	12	V	100	27/ 104	10	0	30	13.2	8.1	19.3	1
57816	00	V	250	26/ 107	13	0	7	0.6	-1.2	17.8	1
58968	12	V	250	25/ 122	21	1	27	13.9	4.2	24.6	3
62337	00	V	200	31/ 34	13	0	23	13.6	14.1	21.1	3
62337	12	V	250	31/ 34	10	0	10	-3.0	14.6	17.1	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – JANUARY 1998

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 758

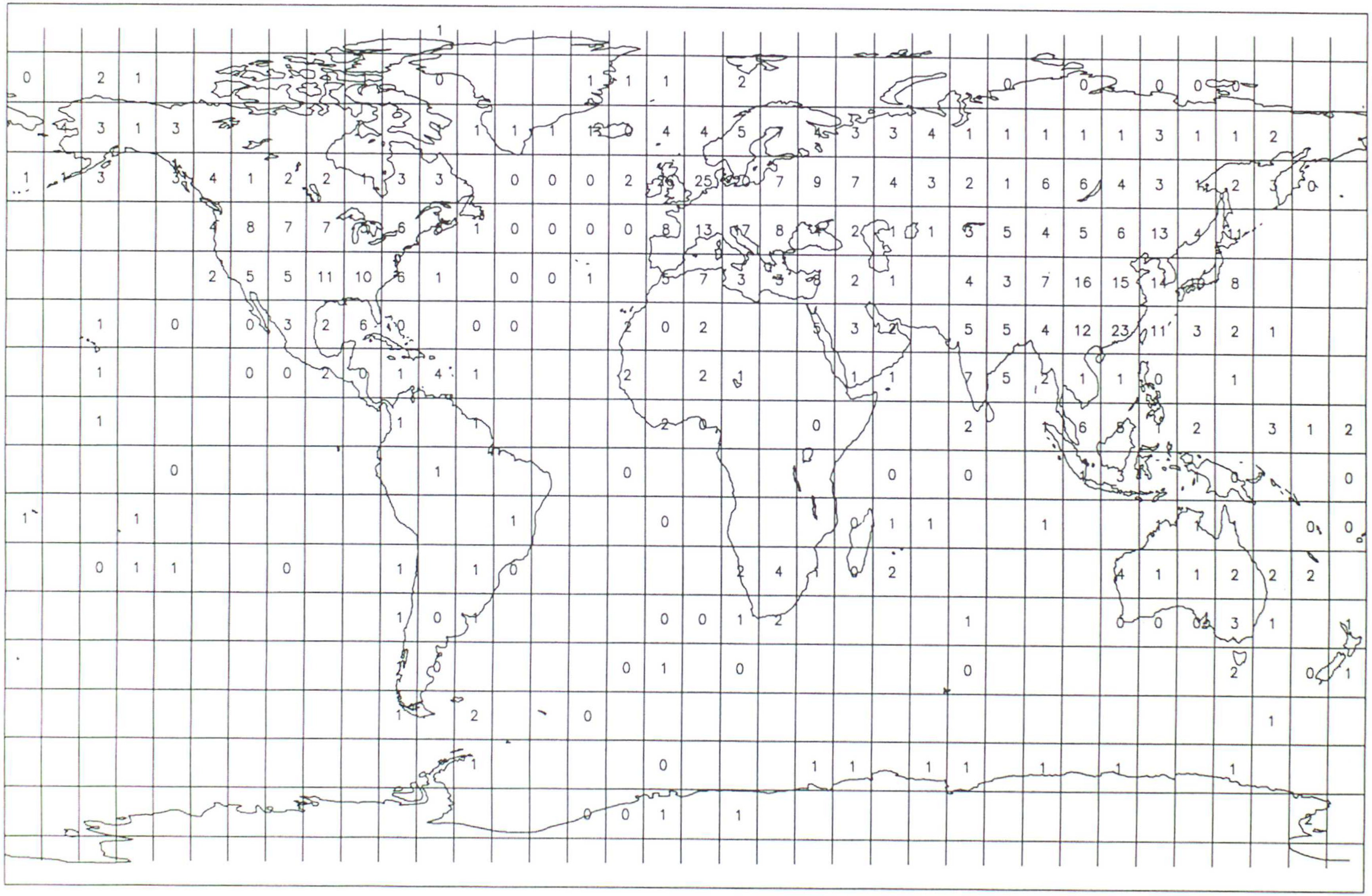


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS $\geq$ 5, and
ABSOLUTE BIAS $\geq$ 10°, with
SD $<$ 30°, and
MAX SPREAD $<$ 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
25399	00	DD	66/-170	15	10.3	4.2	19.0
42339	00	DD	26/ 73	10	11.5	7.0	11.5
42369	00	DD	27/ 81	15	10.9	3.0	7.1
42369	12	DD	27/ 81	18	10.6	5.6	10.5
42397	00	DD	27/ 88	8	20.7	5.5	10.9
42397	12	DD	27/ 88	9	20.5	5.3	9.8
62337	00	DD	31/ 34	12	-10.8	2.0	8.0
68512	12	DD	-30/ 18	12	13.3	8.2	26.5
91334	00	DD	7/ 152	19	-28.5	9.7	27.1
91334	12	DD	7/ 152	19	-34.7	4.7	21.4
91348	00	DD	7/ 158	20	-12.3	9.1	18.8

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

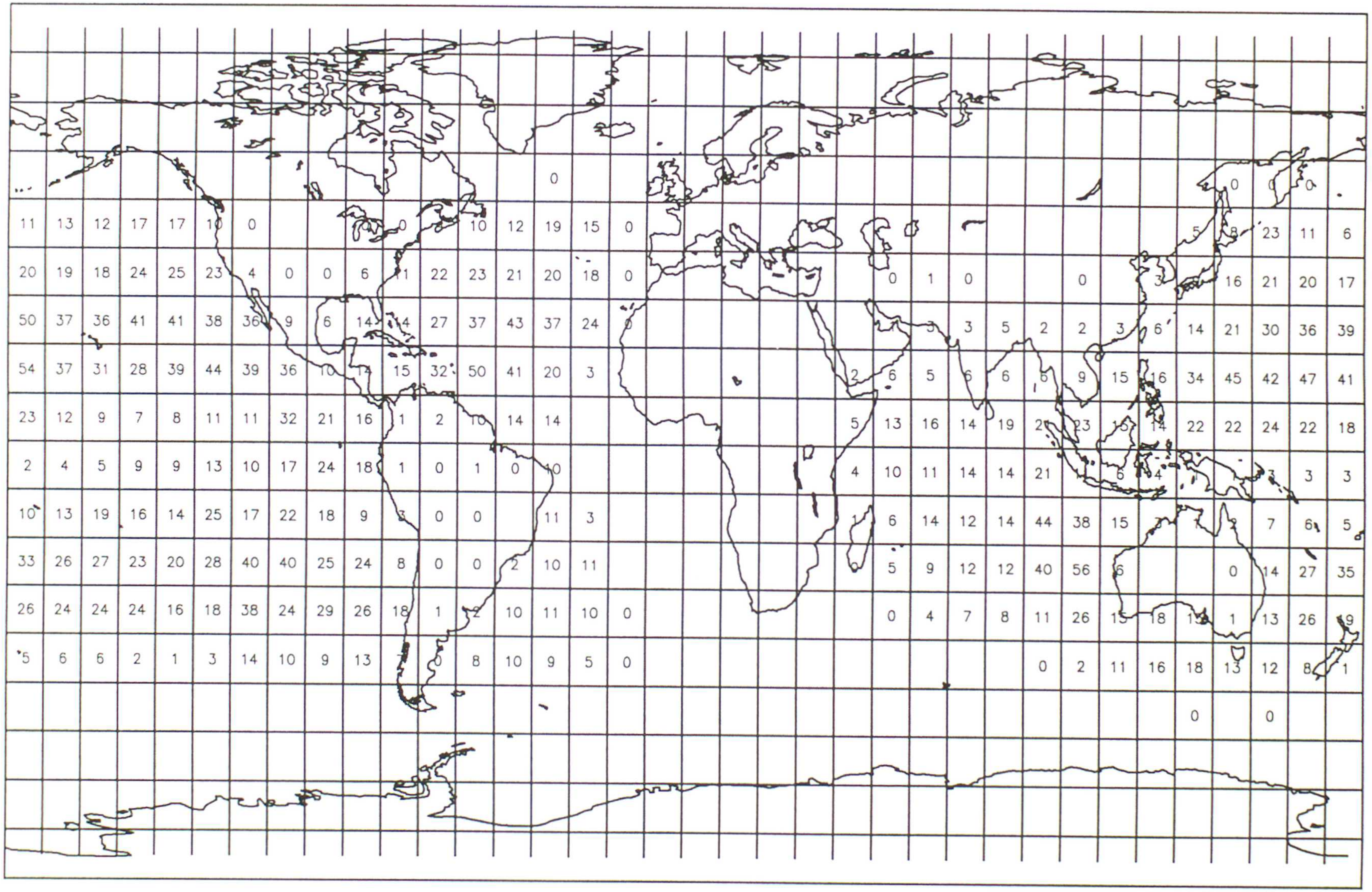
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

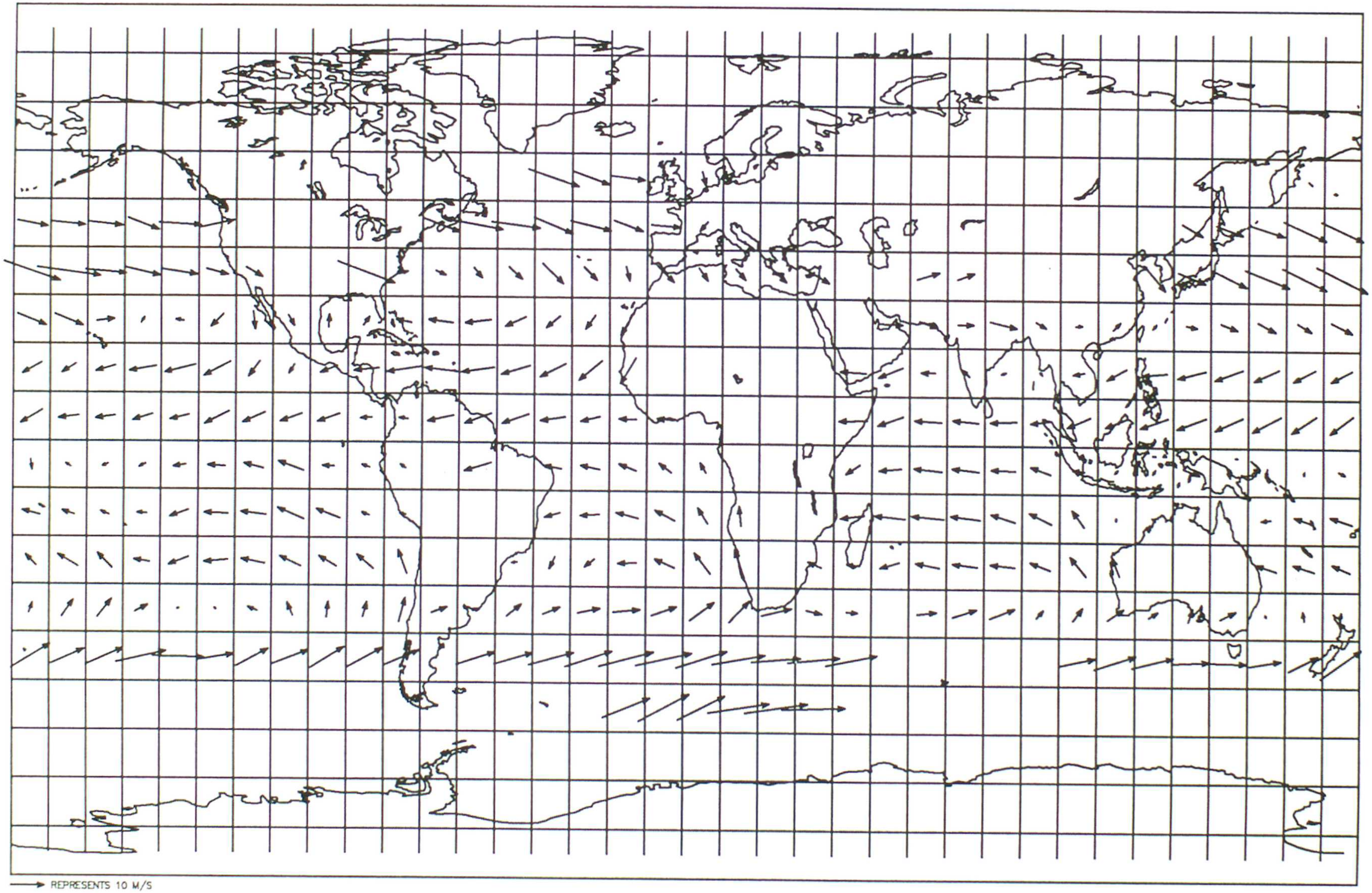
:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JANUARY 1998


0 0 0 0
11 13 12 17 17 10 0 0 0 10 12 19 15 0 5 8 23 11 6
20 19 18 24 25 23 4 0 0 6 11 22 23 21 20 18 0 0 1 0 0 3 16 21 20 17
50 37 36 41 41 38 36 9 6 14 14 27 37 43 37 24 0 3 3 5 2 2 3 6 14 21 30 36 39
54 37 31 28 39 44 39 36 10 14 15 32 50 41 20 3 2 6 5 6 6 6 9 15 16 34 45 42 47 41
23 12 9 7 8 11 11 32 21 16 1 2 10 14 14 5 13 16 14 19 21 23 15 14 22 22 24 22 18
2 4 5 9 9 13 10 17 24 18 1 0 1 0 0 4 10 11 14 14 21 6 4 3 3 3
10 13 19 16 14 25 17 22 18 9 3 0 0 11 3 1 6 14 12 14 44 38 15 7 7 2 7 6 5
33 26 27 23 20 28 40 40 25 24 8 0 0 2 10 11 0 5 9 12 12 40 56 6 0 14 27 35
26 24 24 24 16 18 38 24 29 26 18 1 2 10 11 10 0 0 4 7 8 11 26 15 18 13 1 13 26 19
5 6 6 2 1 3 14 10 9 13 7 0 8 10 9 5 0 0 2 11 16 18 13 12 8 1
0 0

SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
JANUARY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

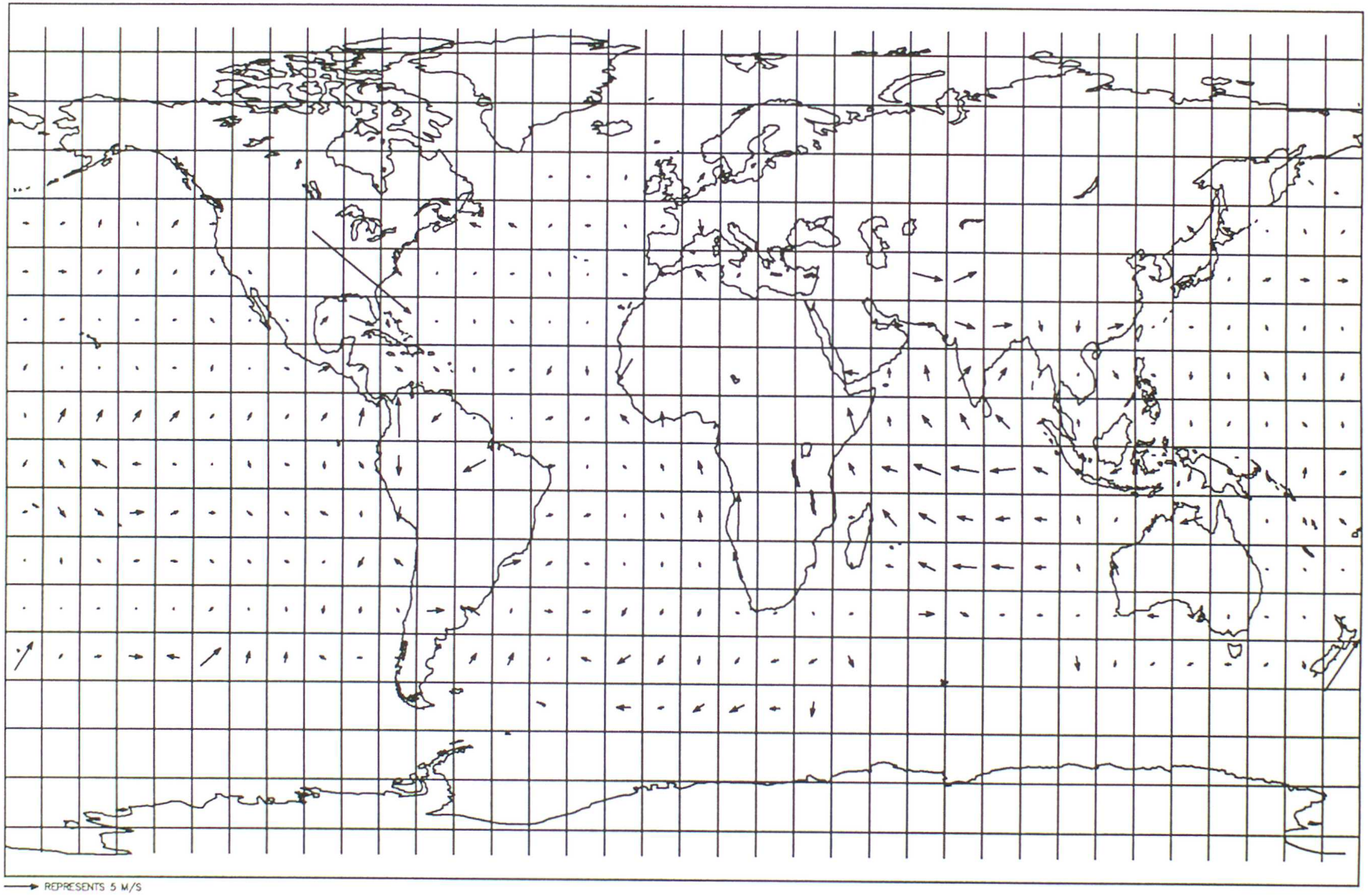
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

JANUARY 1998

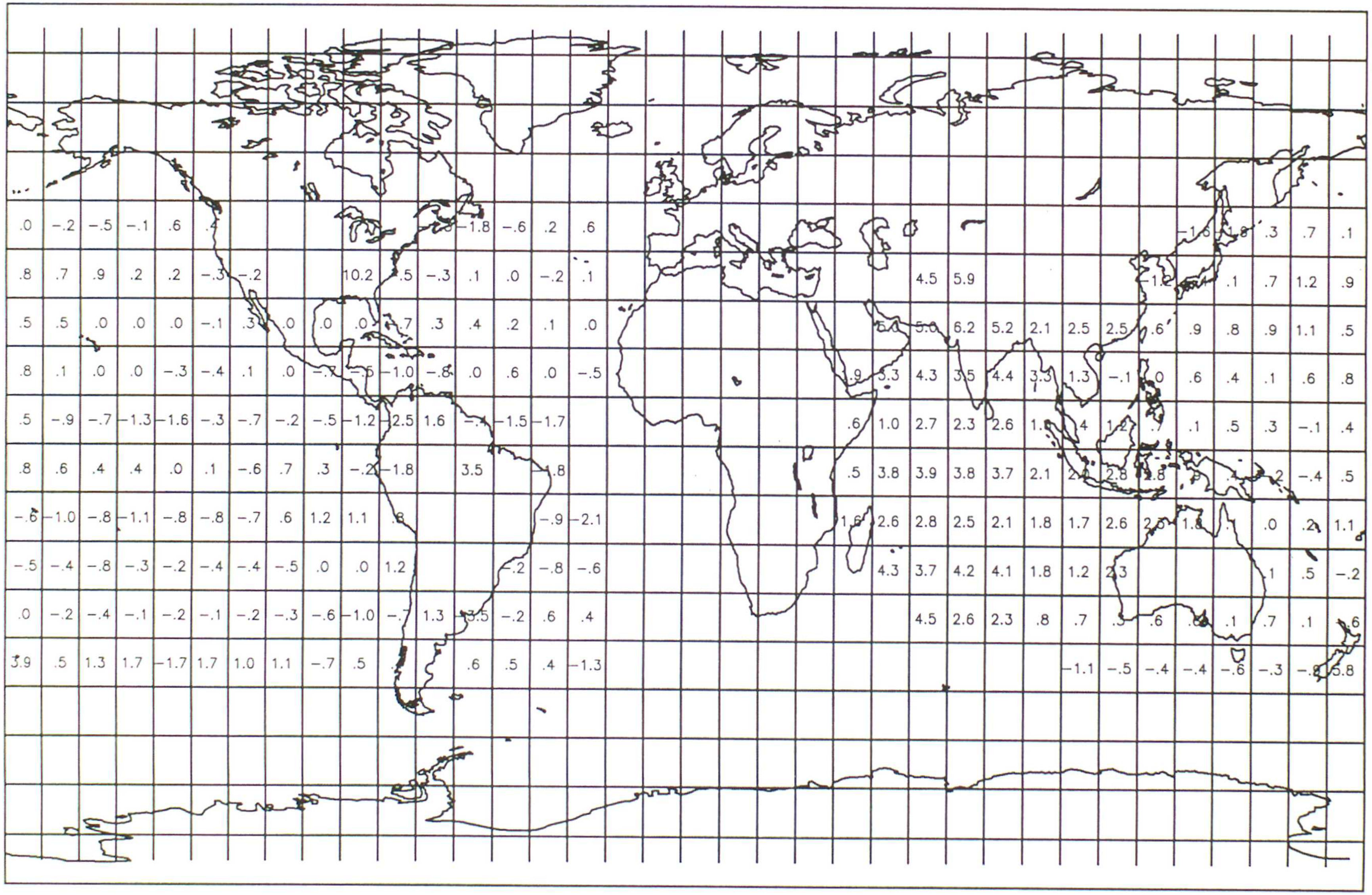
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

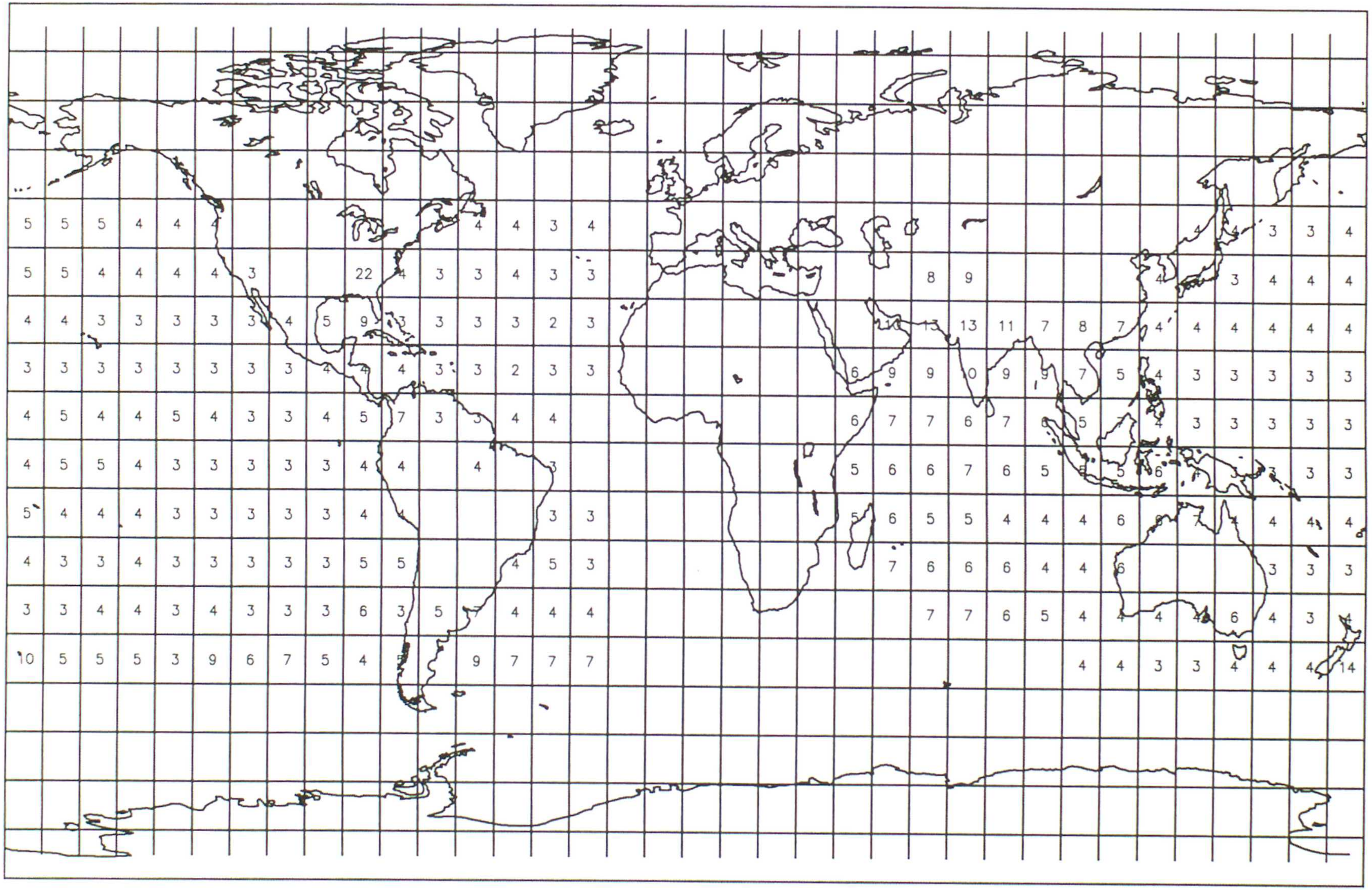
FIGURE 12



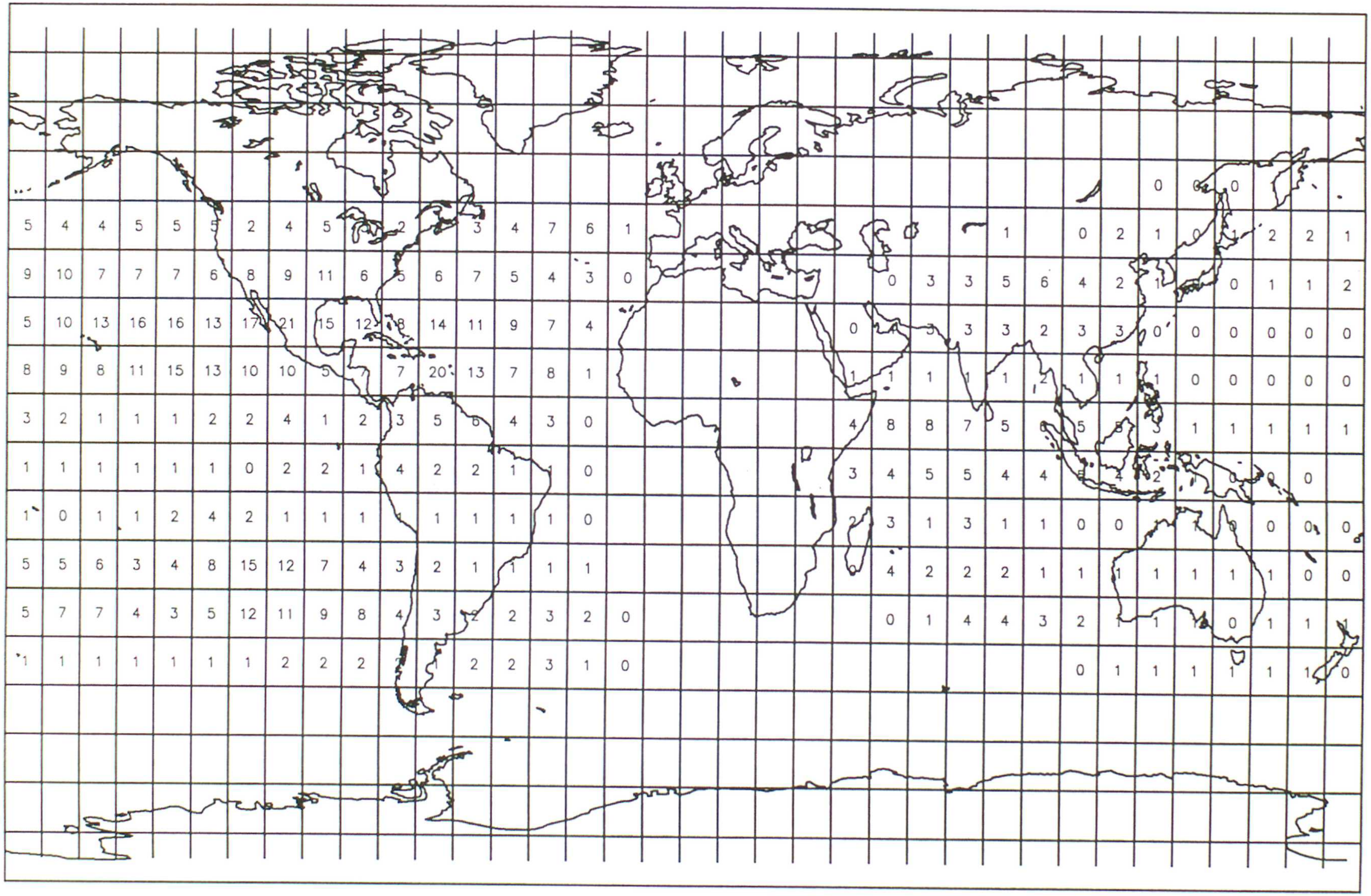
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
JANUARY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.0 −.2 −.5 −.1 .6 .4 −.8 −1.8 −.6 .2 .6 −1.6 1.8 .3 .7 .1
.8 .7 .9 .2 .2 −.3 −.2 10.2 .5 −.3 .1 .0 −.2 .1 4.5 5.9 −1.2 .1 .7 1.2 .9
.5 .5 .0 .0 .0 −.1 .3 .0 .0 .0 .7 .3 .4 .2 .1 .0 5.4 5.0 6.2 5.2 2.1 2.5 2.5 .6 .9 .8 .9 1.1 .5
.8 .1 .0 .0 −.3 −.4 .1 .0 −.7 −.5 −1.0 −.8 .0 .6 .0 −.5 .9 3.3 4.3 3.5 4.4 3.3 1.3 −.1 .0 .6 .4 .1 .6 .8
.5 −.9 −.7 −1.3 −1.6 −.3 −.7 −.2 −.5 −1.2 2.5 1.6 −.4 −1.5 −1.7 .6 1.0 2.7 2.3 2.6 1.8 .4 1.2 .7 .1 .5 .3 −.1 .4
.8 .6 .4 .4 .0 .1 −.6 .7 .3 −.2 −1.8 3.5 1.8 .5 3.8 3.9 3.8 3.7 2.1 2.0 2.8 2.8 .9 .4 .2 −.4 .5
−.6 −1.0 −.8 −1.1 −.8 −.8 −.7 .6 1.2 1.1 .8 −.9 −2.1 1.6 2.6 2.8 2.5 2.1 1.8 1.7 2.6 2.5 1.8 .0 .2 1.1
−.5 −.4 −.8 −.3 −.2 −.4 −.4 −.5 .0 .0 1.2 .2 −.8 −.6 4.3 3.7 4.2 4.1 1.8 1.2 2.3 .1 .5 −.2
.0 −.2 −.4 −.1 −.2 −.1 −.2 −.3 −.6 −1.0 −.7 1.3 3.5 −.2 .6 .4 4.5 2.6 2.3 .8 .7 .3 .6 .6 .1 .7 .1 .6
3.9 .5 1.3 1.7 −1.7 1.7 1.0 1.1 −.7 .5 .6 .5 .4 −1.3 −1.1 −.5 −.4 −.4 −.6 −.3 −.8 5.8

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JANUARY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

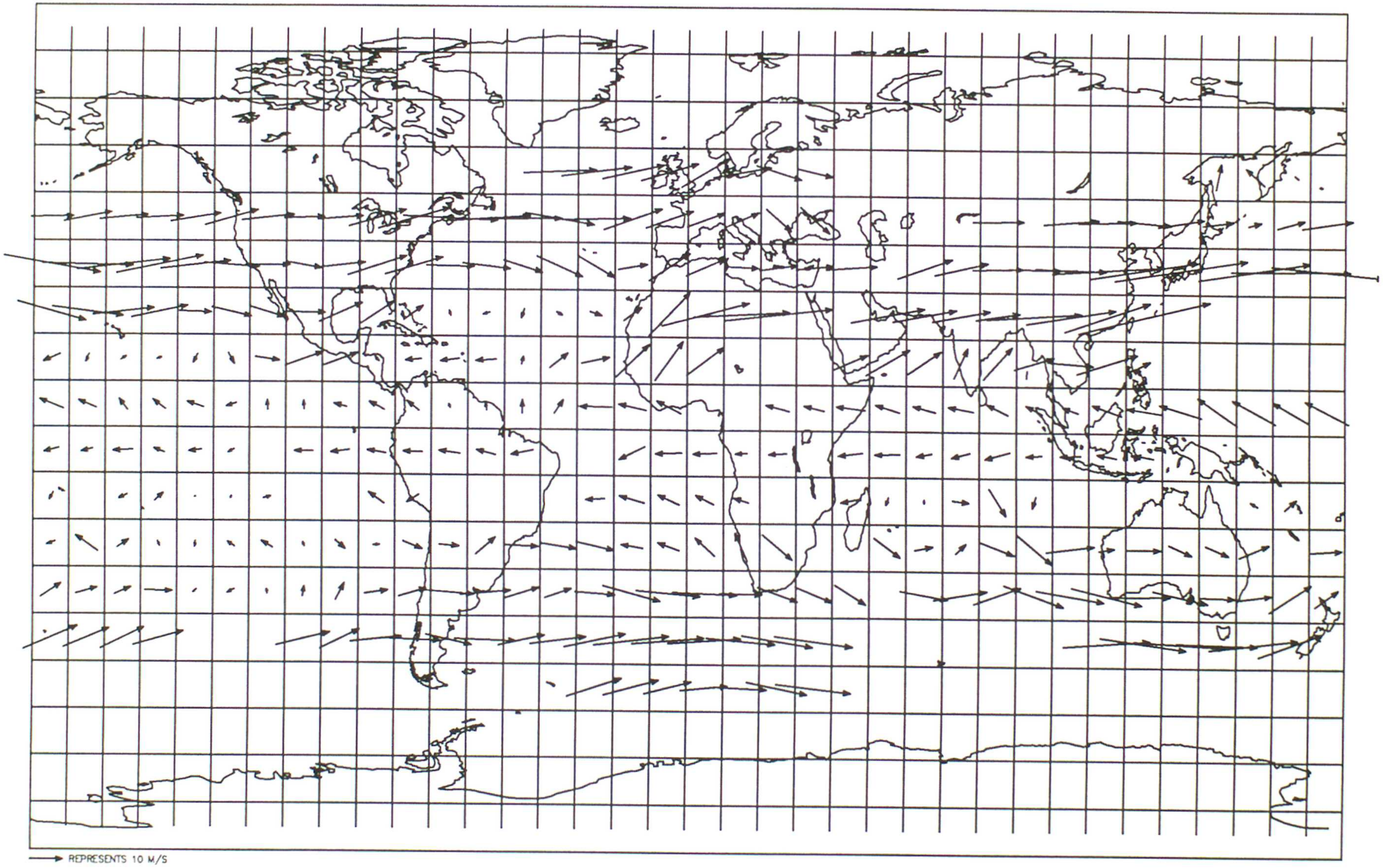

5 5 5 4 4 4 4 4 3 4 4 4 3 3 4
5 5 4 4 4 4 3 22 4 3 3 4 3 3 8 9 4 3 4 4 4
4 4 3 3 3 3 3 4 5 9 3 3 3 3 2 3 10 13 13 11 7 8 7 4 4 4 4 4 4
3 3 3 3 3 3 3 3 4 4 4 3 3 2 3 3 6 9 9 0 9 9 7 5 4 3 3 3 3 3
4 5 4 4 5 4 3 3 4 5 7 3 3 4 4 6 7 7 6 7 6 5 7 4 3 3 3 3 3
4 5 5 4 3 3 3 3 3 4 4 4 3 5 6 6 7 6 5 6 5 6 4 3 3 3 3
5 4 4 4 3 3 3 3 3 4 4 3 3 5 6 5 5 4 4 4 6 6 7 4 4 4 4
4 3 3 4 3 3 3 3 3 5 5 4 5 3 7 6 6 6 4 4 6 3 3 3
3 3 4 4 3 4 3 3 3 6 3 5 7 4 4 4 7 7 6 5 4 4 4 4 6 4 3 4
10 5 5 5 3 9 6 7 5 4 5 9 7 7 7 4 4 3 3 4 4 4 14

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JANUARY 1998


0 0 0
5 4 4 5 5 5 2 4 5 5 2 3 4 7 6 1 1 0 2 1 0 1 2 2 1
9 10 7 7 7 6 8 9 11 6 5 6 7 5 4 3 0 0 3 3 5 6 4 2 1 0 1 1 2
5 10 13 16 16 13 17 21 15 12 8 14 11 9 7 4 0 4 3 3 3 2 3 3 0 0 0 0 0 0
8 9 8 11 15 13 10 10 5 7 7 20 13 7 8 1 1 1 1 1 1 2 1 1 1 0 0 0 0 0
3 2 1 1 1 2 2 4 1 2 3 5 6 4 3 0 4 8 8 7 5 6 5 5 3 1 1 1 1 1
1 1 1 1 1 1 0 2 2 1 4 2 2 1 1 0 3 4 5 5 4 4 5 4 2 1 0 0 0
1 0 1 1 2 4 2 1 1 1 1 1 1 1 1 0 2 3 1 3 1 1 0 0 1 1 0 0 0 0
5 5 6 3 4 8 15 12 7 4 3 2 1 1 1 1 4 2 2 2 1 1 1 1 1 1 1 0 0
5 7 7 4 3 5 12 11 9 8 4 3 2 2 3 2 0 0 1 4 4 3 2 1 1 1 0 1 1 1
1 1 1 1 1 1 1 2 2 2 2 1 2 2 3 1 0 0 1 1 1 1 1 1 1 0

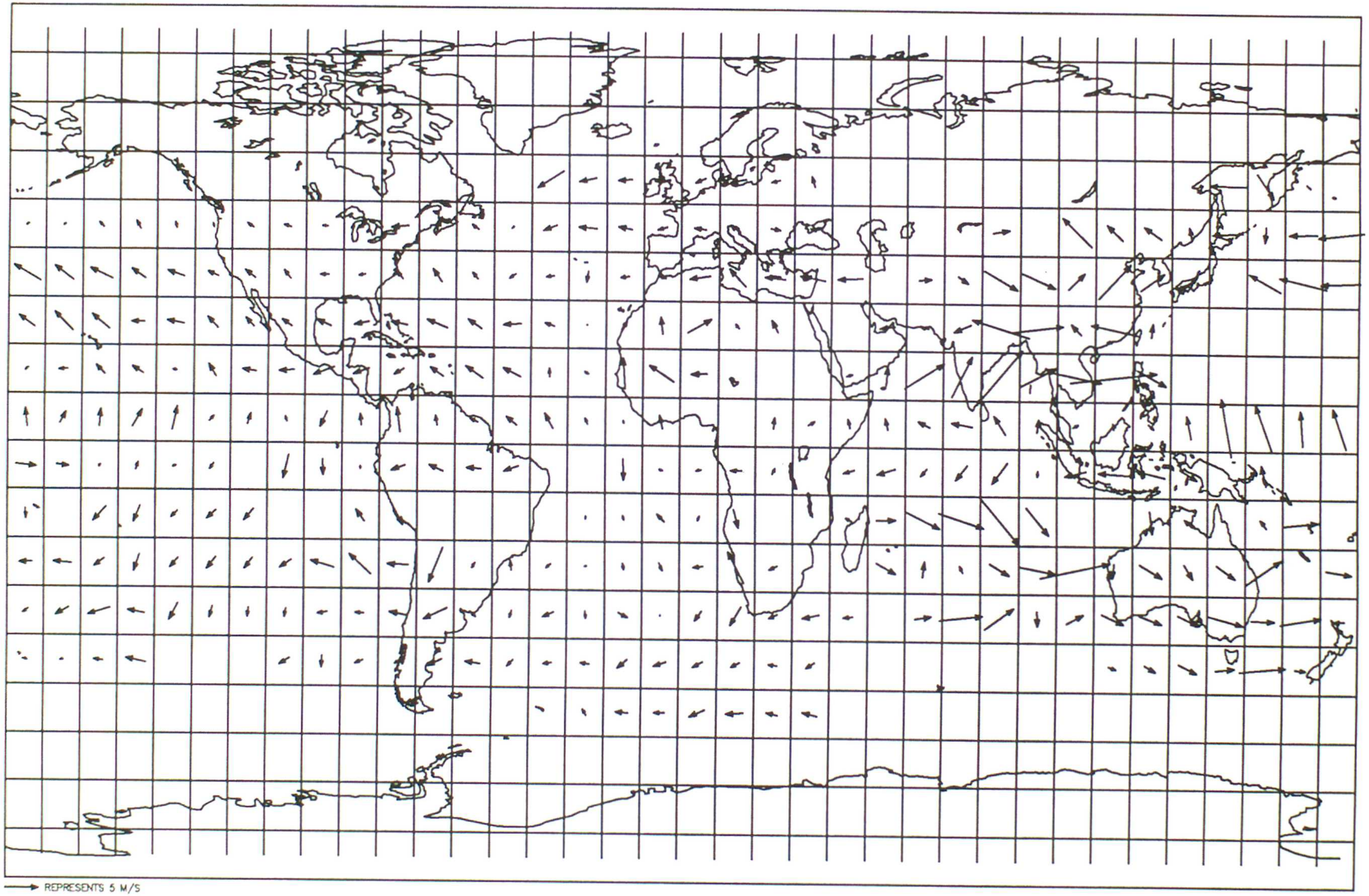
SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
JANUARY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

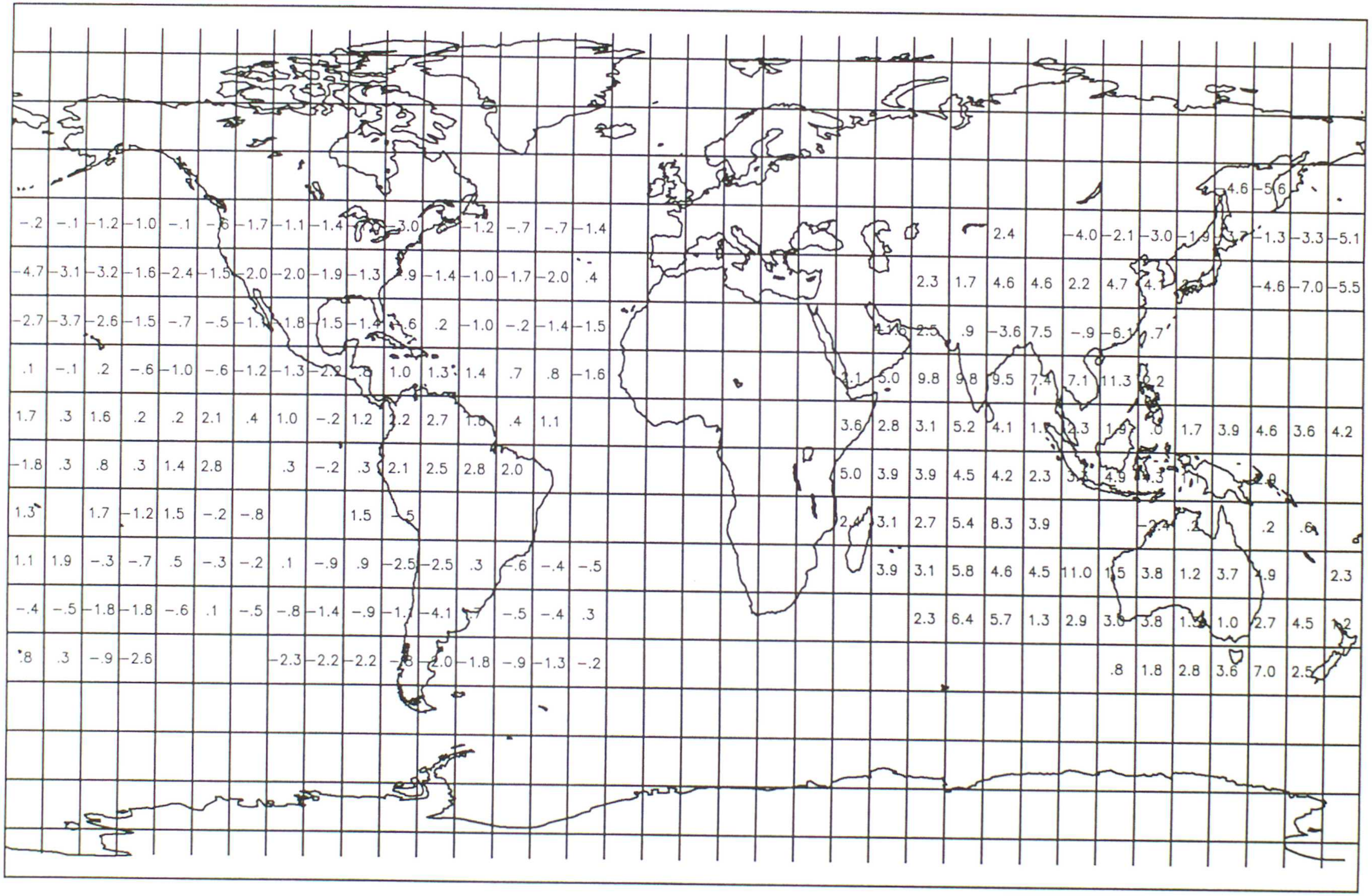

REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 401–700 HPA
JANUARY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

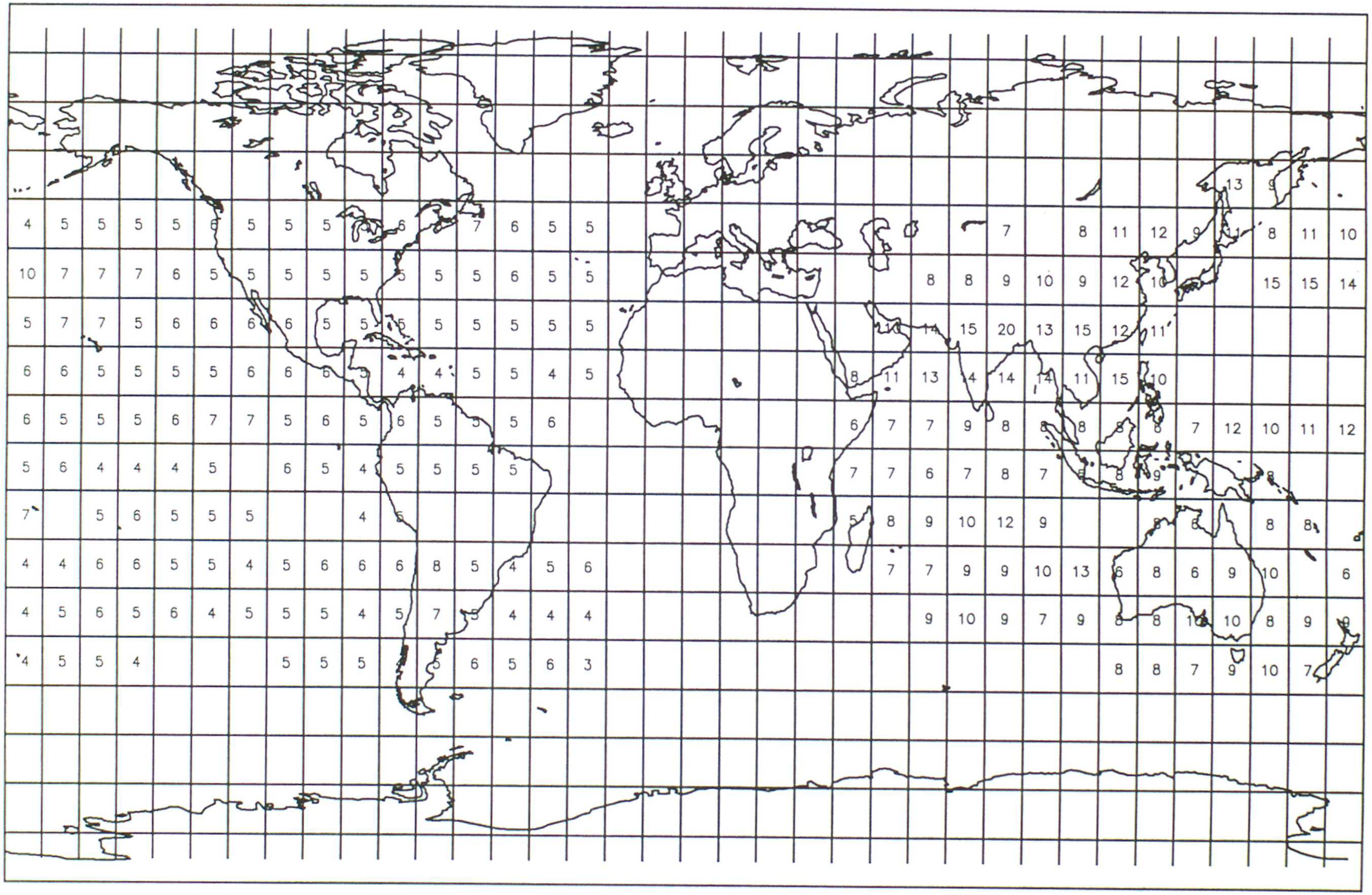
FIGURE 17



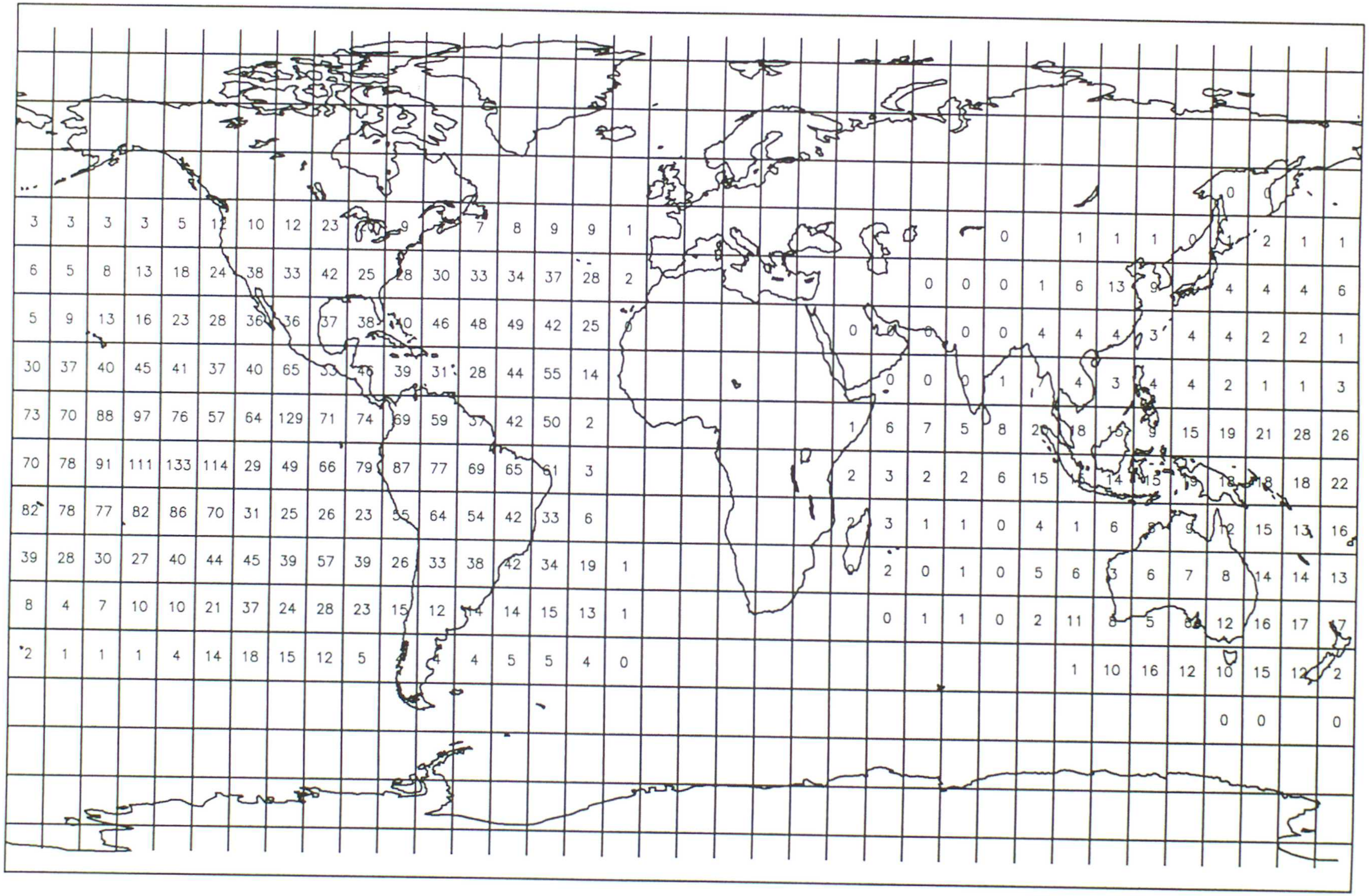
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JANUARY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-4.6 -5.6
-.2 -.1 -1.2 -1.0 -.1 -.6 -1.7 -1.1 -1.4 -3.0 -1.2 -.7 -.7 -1.4 2.4 -4.0 -2.1 -3.0 -1.9 -1.3 -3.3 -5.1
-4.7 -3.1 -3.2 -1.6 -2.4 -1.5 -2.0 -2.0 -1.9 -1.3 .9 -1.4 -1.0 -1.7 -2.0 .4 2.3 1.7 4.6 4.6 2.2 4.7 4.1 -4.6 -7.0 -5.5
-2.7 -3.7 -2.6 -1.5 -.7 -.5 -1.8 -1.5 -1.4 .6 .2 -1.0 -.2 -1.4 -1.5 2.5 .9 -3.6 7.5 -.9 -6.1 .7
.1 -.1 .2 -.6 -1.0 -.6 -1.2 -1.3 -2.2 .8 1.0 1.3 1.4 .7 .8 -1.6 3.1 5.0 9.8 9.8 9.5 7.4 7.1 11.3 2.2
1.7 .3 1.6 .2 .2 2.1 .4 1.0 -.2 1.2 2.2 2.7 .4 1.1 3.6 2.8 3.1 5.2 4.1 2.3 1.9 .0 1.7 3.9 4.6 3.6 4.2
-1.8 .3 .8 .3 1.4 2.8 .3 -.2 .3 2.1 2.5 2.8 2.0 5.0 3.9 3.9 4.5 4.2 2.3 4.9 4.3
1.3 1.7 -1.2 1.5 -.2 -.8 1.5 -.5 2.4 3.1 2.7 5.4 8.3 3.9 -2.4 .2 .2 .6
1.1 1.9 -.3 -.7 .5 -.3 -.2 .1 -.9 .9 -2.5 -2.5 .3 -.6 -.4 -.5 3.9 3.1 5.8 4.6 4.5 11.0 1.5 3.8 1.2 3.7 .9 2.3
-.4 -.5 -1.8 -1.8 -.6 .1 -.5 -.8 -1.4 -.9 -4.1 -.5 -.4 .3 2.3 6.4 5.7 1.3 2.9 3.0 3.8 1.0 2.7 4.5 1.2
.8 .3 -.9 -2.6 -2.3 -2.2 -2.2 2.0 -1.8 -.9 -1.3 -.2 .8 1.8 2.8 3.6 7.0 2.5

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
JANUARY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

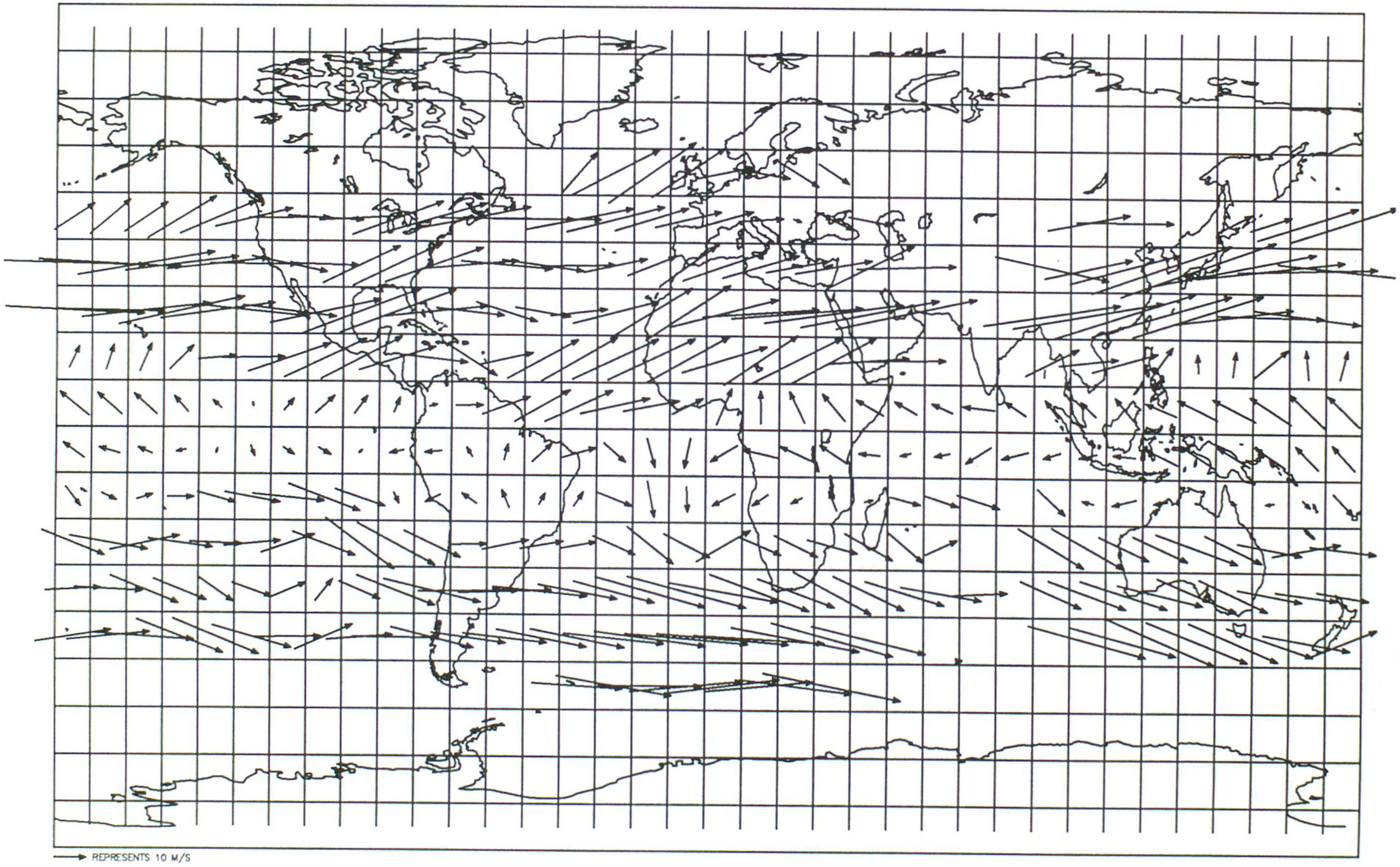

13 9
4 5 5 5 5 6 5 5 5 6 7 6 5 5 7 8 11 12 9 11 8 11 10
10 7 7 7 6 5 5 5 5 5 5 5 5 6 5 5 8 8 9 10 9 12 10 15 15 14
5 7 7 5 6 6 6 6 5 5 5 5 5 5 5 5 10 14 15 20 13 15 12 11
6 6 5 5 5 5 6 6 6 5 4 4 5 5 4 5 8 11 13 14 14 14 11 15 10
6 5 5 5 6 7 7 5 6 5 6 5 5 5 6 6 7 7 9 8 8 8 8 6 7 12 10 11 12
5 6 4 4 4 5 6 5 4 5 5 5 5 7 7 6 7 8 7 8 8 9
7 5 6 5 5 5 4 6 5 8 9 10 12 9 8 6 8 8
4 4 6 6 5 5 4 5 6 6 6 8 5 4 5 6 7 7 9 9 10 13 6 8 6 9 10 6
4 5 6 5 6 4 5 5 5 4 5 7 5 4 4 4 9 10 9 7 9 8 8 10 10 8 9 9
4 5 5 4 5 5 5 5 6 5 6 3 8 8 7 9 10 7

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JANUARY 1998


0 0
3 3 3 3 5 12 10 12 23 20 9 7 8 9 9 1 0 1 1 1 0 1 2 1 1
6 5 8 13 18 24 38 33 42 25 28 30 33 34 37 28 2 0 0 0 1 6 13 9 4 4 4 6
5 9 13 16 23 28 36 36 37 38 40 46 48 49 42 25 0 0 0 0 0 0 4 4 4 3 4 4 2 2 1
30 37 40 45 41 37 40 65 33 46 39 31 28 44 55 14 0 0 0 1 7 4 3 4 4 2 1 1 3
73 70 88 97 76 57 64 129 71 74 69 59 37 42 50 2 1 6 7 5 8 20 18 15 9 15 19 21 28 26
70 78 91 111 133 114 29 49 66 79 87 77 69 65 61 3 2 3 2 2 6 15 15 14 15 19 18 18 18 22
82 78 77 82 86 70 31 25 26 23 55 64 54 42 33 6 2 3 1 1 0 4 1 6 8 9 12 15 13 16
39 28 30 27 40 44 45 39 57 39 26 33 38 42 34 19 1 2 0 1 0 5 6 3 6 7 8 14 14 13
8 4 7 10 10 21 37 24 28 23 15 12 14 14 15 13 1 0 1 1 0 2 11 8 5 6 12 16 17 17
2 1 1 1 4 14 18 15 12 5 4 4 4 5 5 4 0 1 10 16 12 10 15 12 2
0 0 0

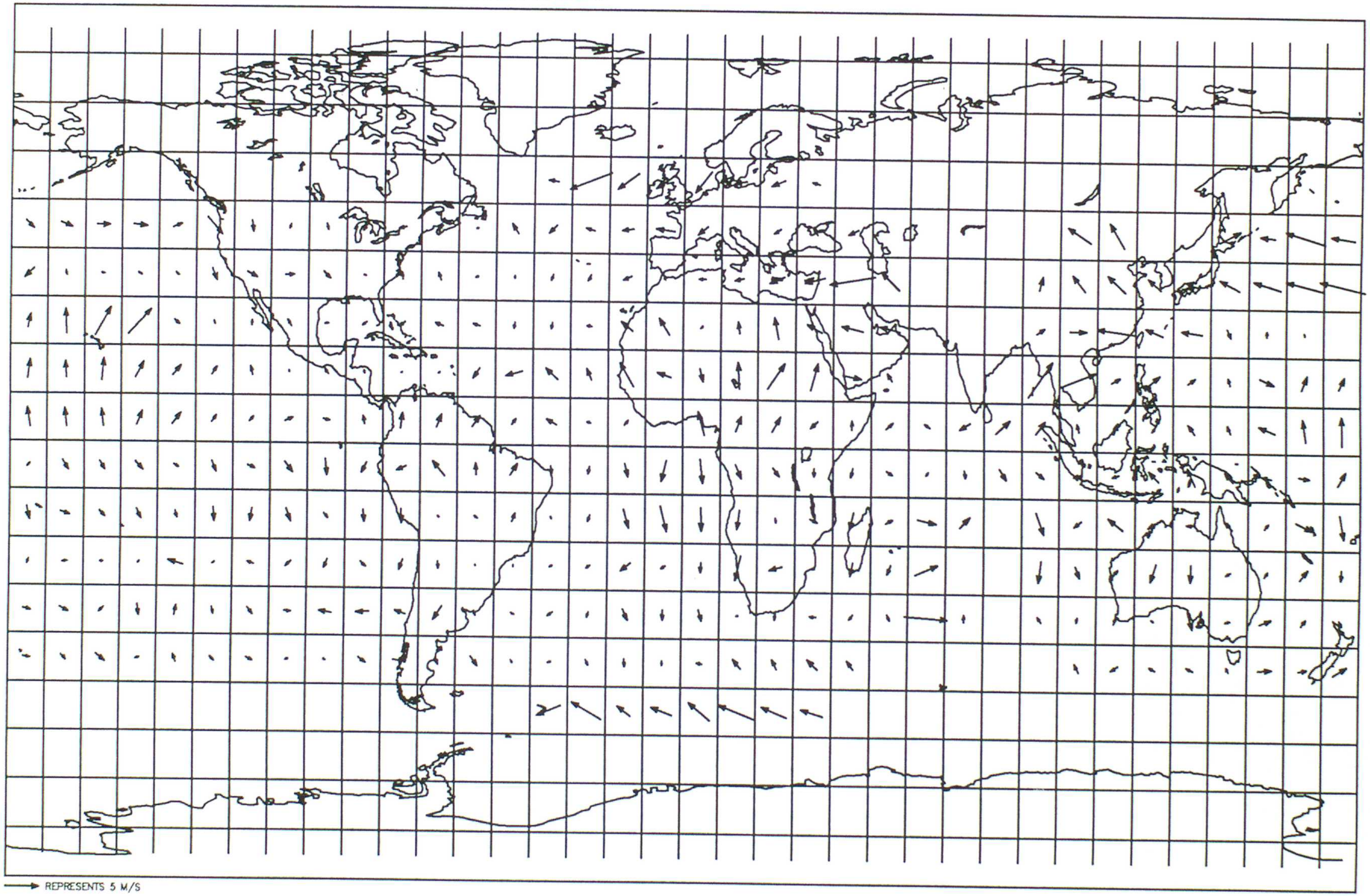
SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
JANUARY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21

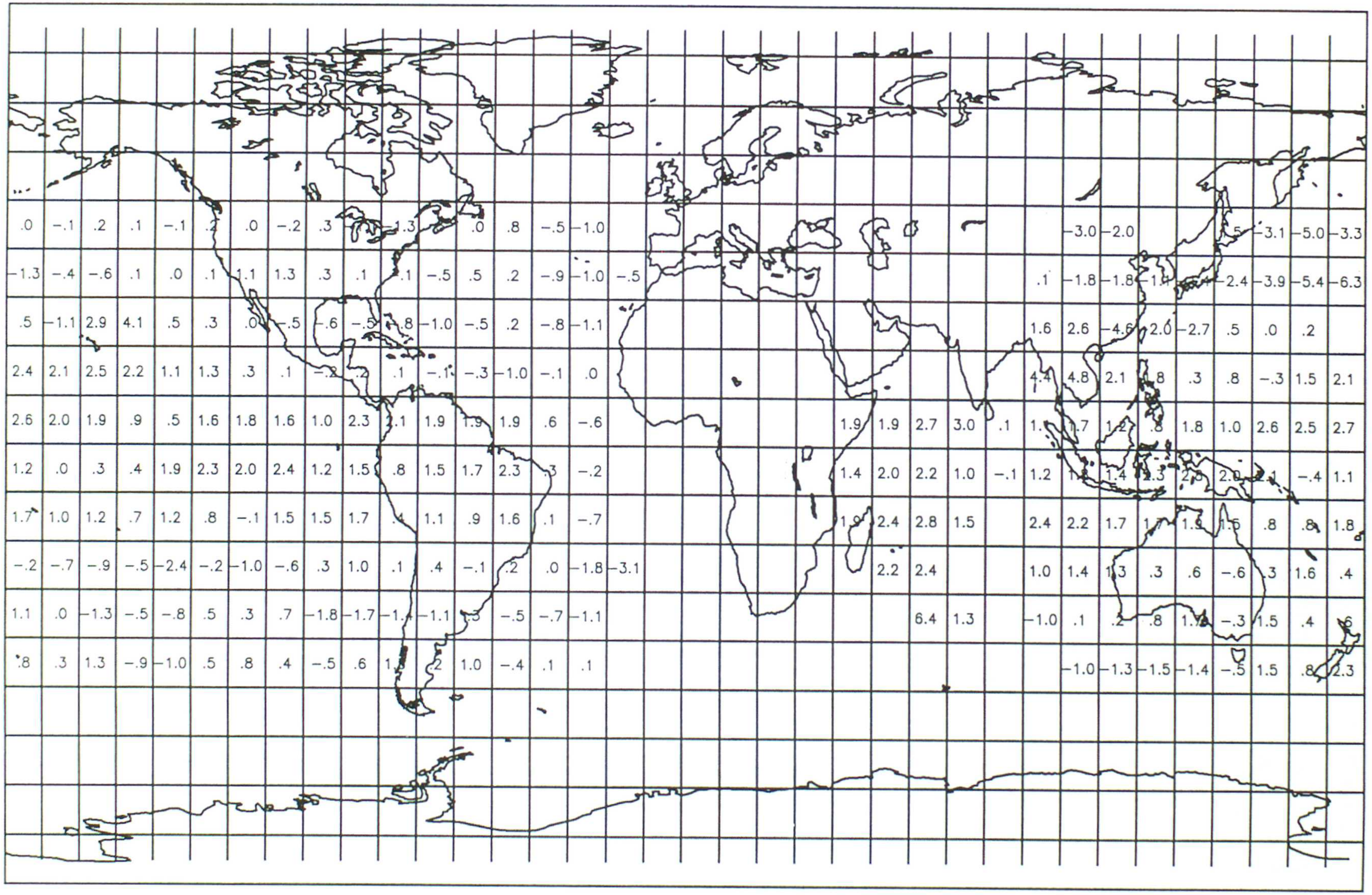

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA
JANUARY 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

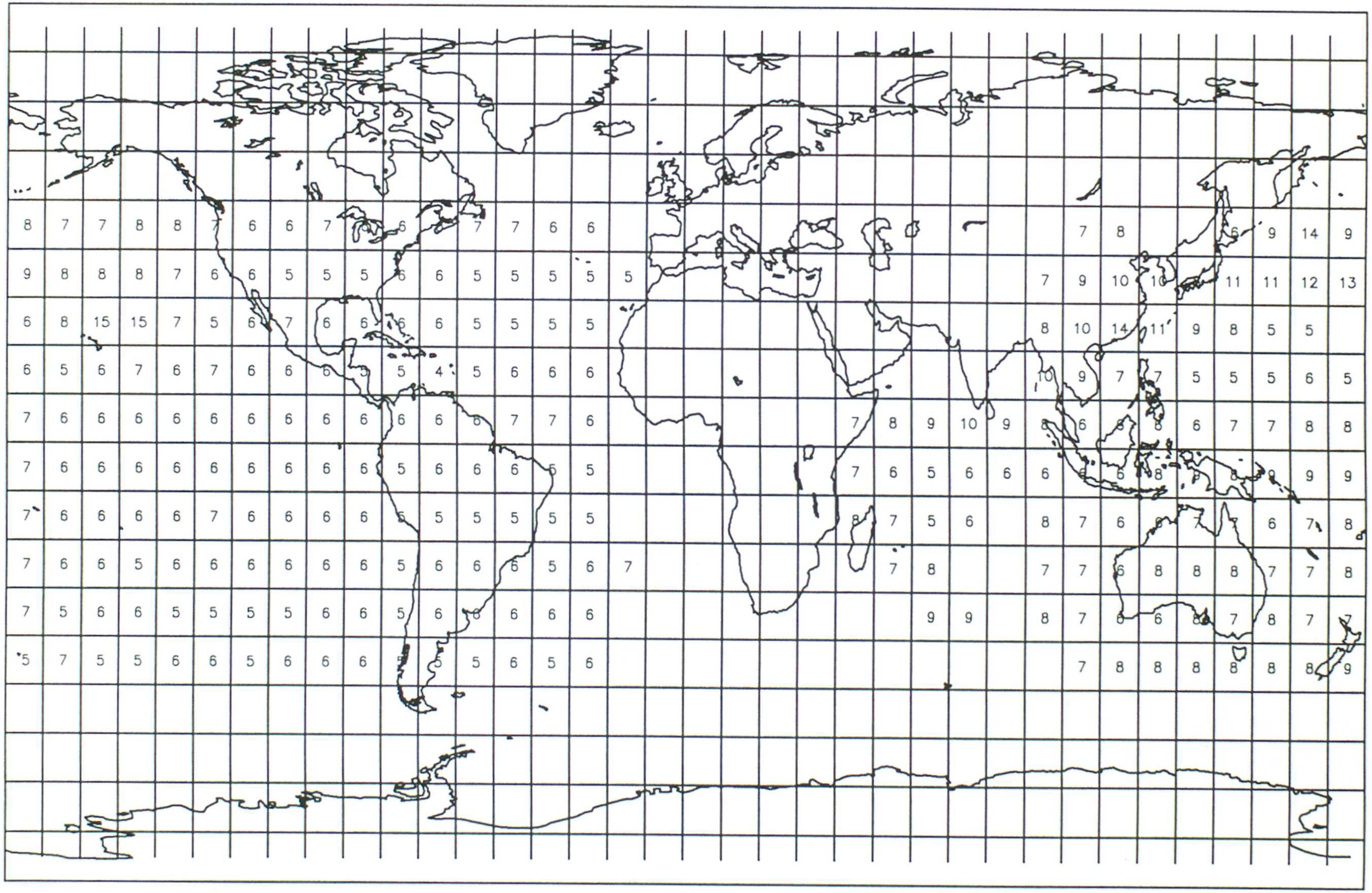
FIGURE 22



SATOBS : MEAN O−B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JANUARY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.0 −.1 .2 .1 −.1 .2 .0 −.2 .3 −1.3 .0 .8 −.5 −1.0 −3.0 −2.0 .5 −3.1 −5.0 −3.3
−1.3 −.4 −.6 .1 .0 .1 1.1 1.3 .3 .1 .1 −.5 .5 .2 −.9 −1.0 −.5 .1 −1.8 −1.8 −1.9 −2.4 −3.9 −5.4 −6.3
.5 −1.1 2.9 4.1 .5 .3 .0 −.5 −.6 −.5 −.8 −1.0 −.5 .2 −.8 −1.1 1.6 2.6 −4.6 −2.0 −2.7 .5 .0 .2
2.4 2.1 2.5 2.2 1.1 1.3 .3 .1 −.2 .2 .1 −.1 −.3 −1.0 −.1 .0 4.4 4.8 2.1 .8 .3 .8 −.3 1.5 2.1
2.6 2.0 1.9 .9 .5 1.6 1.8 1.6 1.0 2.3 2.1 1.9 1.9 1.9 .6 −.6 1.9 1.9 2.7 3.0 .1 1.1 .7 1.2 .8 1.8 1.0 2.6 2.5 2.7
1.2 .0 .3 .4 1.9 2.3 2.0 2.4 1.2 1.5 .8 1.5 1.7 2.3 .3 −.2 1.4 2.0 2.2 1.0 −.1 1.2 1.4 1.4 2.3 2.5 2.0 2.1 −.4 1.1
1.7 1.0 1.2 .7 1.2 .8 −.1 1.5 1.5 1.7 .4 1.1 .9 1.6 .1 −.7 1.9 2.4 2.8 1.5 2.4 2.2 1.7 1.7 1.5 1.5 .8 .8 1.8
−.2 −.7 −.9 −.5 −2.4 −.2 −1.0 −.6 .3 1.0 .1 .4 −.1 .2 .0 −1.8 −3.1 2.2 2.4 1.0 1.4 1.3 .3 .6 −.6 .3 1.6 .4
1.1 .0 −1.3 −.5 −.8 .5 .3 .7 −1.8 −1.7 −1.4 −1.1 1.3 −.5 −.7 −1.1 6.4 1.3 −1.0 .1 .2 .8 1.7 −.3 1.5 .4 .6
.8 .3 1.3 −.9 −1.0 .5 .8 .4 −.5 .6 1.5 .2 1.0 −.4 .1 .1 −1.0 −1.3 −1.5 −1.4 −.5 1.5 .8 2.3

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JANUARY 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-14 500 km.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13903	26.3	-43.2	ALL	MSLP	SUR	203	0	0	0.8	0.7	1.1
13906	23.5	-53.9	ALL	MSLP	SUR	198	0	0	0.9	0.0	0.9
13910	27.7	-48.2	ALL	MSLP	SUR	205	0	0	0.8	-2.1	2.3
13912	17.7	-61.8	ALL	MSLP	SUR	189	0	0	1.1	0.5	1.2
13913	19.1	-53.0	ALL	MSLP	SUR	211	0	0	0.9	-0.2	0.9
41505	20.4	-53.7	ALL	MSLP	SUR	241	0	0	0.9	0.6	1.0
41506	16.3	-57.1	ALL	MSLP	SUR	318	0	0	1.0	0.4	1.1
41522	12.9	-52.1	ALL	MSLP	SUR	250	0	0	1.1	0.7	1.3
41524	14.3	-54.6	ALL	MSLP	SUR	324	0	0	1.0	0.4	1.0
41924	19.3	-43.6	ALL	MSLP	SUR	199	0	0	0.9	-2.1	2.3
44609	51.4	-35.1	ALL	MSLP	SUR	785	1	0	1.7	0.0	1.7
44610	44.2	-47.1	ALL	MSLP	SUR	476	4	1	1.9	0.6	1.9
44614	54.9	-38.2	ALL	MSLP	SUR	818	2	0	1.8	0.5	1.9
44616	50.6	-36.9	ALL	MSLP	SUR	802	6	1	2.2	0.1	2.2
44617	50.3	-37.7	ALL	MSLP	SUR	767	2	0	2.0	-0.7	2.1
44621	54.1	-25.3	ALL	MSLP	SUR	617	0	0	1.8	-0.9	2.0
44624	62.8	-16.6	ALL	MSLP	SUR	1143	1	0	1.7	0.2	1.7
44727	56.7	-30.9	ALL	MSLP	SUR	1602	11	1	1.4	-0.4	1.4
44728	63.4	-28.7	ALL	MSLP	SUR	1148	53	5	1.2	0.1	1.2
44742	39.7	-10.7	ALL	MSLP	SUR	566	4	1	1.2	-0.3	1.3
44743	43.6	-6.8	ALL	MSLP	SUR	115	0	0	1.4	-0.9	1.7
44760	34.5	-40.5	ALL	MSLP	SUR	233	1	0	1.1	-0.2	1.1
44761	55.9	-37.0	ALL	MSLP	SUR	750	6	1	2.2	0.9	2.4
44762	37.8	-11.0	ALL	MSLP	SUR	552	1	0	1.0	-0.2	1.0
44763	45.1	-47.1	ALL	MSLP	SUR	442	6	1	2.3	0.3	2.3
44765	58.9	-41.8	ALL	MSLP	SUR	694	6	1	2.1	0.3	2.2
44766	52.5	-40.7	ALL	MSLP	SUR	674	4	1	2.7	0.5	2.7
44768	58.2	-22.7	ALL	MSLP	SUR	1184	3	0	1.7	0.1	1.7
44769	52.4	-15.0	ALL	MSLP	SUR	928	1	0	1.9	-0.3	1.9
44771	51.4	-33.0	ALL	MSLP	SUR	736	4	1	2.2	0.5	2.2
44773	59.1	-29.8	ALL	MSLP	SUR	1177	0	0	1.3	-0.1	1.3
44775	58.2	-38.3	ALL	MSLP	SUR	1154	3	0	1.4	0.1	1.4
44776	50.3	-9.0	ALL	MSLP	SUR	12	11	92	0.0	8.9	8.9
44780	53.1	-33.2	ALL	MSLP	SUR	877	1	0	1.7	-0.4	1.7
44834	49.2	-46.5	ALL	MSLP	SUR	45	0	0	2.2	1.4	2.6
44901	53.7	-49.9	ALL	MSLP	SUR	89	2	2	3.2	2.0	3.7
44911	58.3	-11.7	ALL	MSLP	SUR	47	0	0	1.9	1.1	2.2
44912	52.9	-23.0	ALL	MSLP	SUR	52	4	8	1.8	1.1	2.1
44925	60.6	-54.2	ALL	MSLP	SUR	56	1	2	2.4	0.8	2.5
62552	58.7	-8.8	ALL	MSLP	SUR	662	2	0	2.0	-0.9	2.2
62553	51.9	-22.8	ALL	MSLP	SUR	567	1	0	1.8	-0.1	1.8
62554	56.9	-9.5	ALL	MSLP	SUR	628	0	0	1.9	0.2	1.9
62555	43.4	-12.2	ALL	MSLP	SUR	798	3	0	1.1	-0.2	1.1
62556	48.3	-24.2	ALL	MSLP	SUR	876	3	0	1.8	0.0	1.8
62557	47.4	-14.7	ALL	MSLP	SUR	909	1	0	1.5	0.3	1.6
62558	52.8	-15.3	ALL	MSLP	SUR	907	4	0	1.8	0.4	1.9
62673	58.6	-33.9	ALL	MSLP	SUR	350	0	0	1.3	-0.1	1.3
62674	58.4	-29.0	ALL	MSLP	SUR	332	0	0	1.3	-0.1	1.3
62697	50.0	-16.2	ALL	MSLP	SUR	648	6	1	1.7	-0.3	1.8
62803	68.0	-61.8	ALL	MSLP	SUR	1742	0	0	1.4	0.0	1.4
62927	56.6	-11.2	ALL	MSLP	SUR	34	0	0	1.0	0.4	1.1
62929	55.9	-34.9	ALL	MSLP	SUR	32	1	3	1.5	0.6	1.6
64528	58.4	-30.3	ALL	MSLP	SUR	1583	1	0	1.3	-0.4	1.3
64530	60.5	-46.5	ALL	MSLP	SUR	1106	17	2	2.2	0.3	2.2
64552	63.9	-30.3	ALL	MSLP	SUR	929	4	0	1.7	0.4	1.8
64561	52.4	-25.8	ALL	MSLP	SUR	778	4	1	1.8	-0.4	1.8
64563	54.7	-46.6	ALL	MSLP	SUR	1203	9	1	4.1	-2.3	4.7
65591	58.5	-39.3	ALL	MSLP	SUR	681	3	0	1.4	-0.3	1.4
65592	59.4	-38.1	ALL	MSLP	SUR	1287	6	0	1.3	-0.3	1.3
65594	63.7	-30.8	ALL	MSLP	SUR	1760	2	0	1.1	-0.1	1.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
65596	49.1	-36.3	ALL	MSLP	SUR	231	3	1	2.7	-1.3	3.0
65597	53.1	-39.8	ALL	MSLP	SUR	1136	3	0	1.9	-0.6	1.9
WIND SPEED											
41505	20.4	-53.7	ALL	SPEED	SUR	131	0	0	2.6	-5.5	6.0
41506	16.3	-57.1	ALL	SPEED	SUR	171	0	0	3.2	-0.5	3.2
41522	12.9	-52.1	ALL	SPEED	SUR	132	0	0	2.2	0.1	2.2
41523	12.9	-54.7	ALL	SPEED	SUR	165	0	0	1.4	0.2	1.4
41524	14.3	-54.6	ALL	SPEED	SUR	174	0	0	1.5	0.4	1.5
42552	59.5	-7.5	ALL	SPEED	SUR	1	0	0	0.0	0.4	0.4
44609	51.4	-35.1	ALL	SPEED	SUR	560	113	20	8.5	5.0	9.9
44610	44.2	-47.1	ALL	SPEED	SUR	273	0	0	3.5	0.7	3.6
44621	54.1	-25.3	ALL	SPEED	SUR	296	0	0	3.7	-0.5	3.7
44624	62.8	-16.6	ALL	SPEED	SUR	619	1	0	3.6	-3.1	4.7
44742	39.7	-10.7	ALL	SPEED	SUR	325	0	0	2.0	-1.2	2.3
44762	37.8	-11.0	ALL	SPEED	SUR	323	0	0	1.6	-1.4	2.2
44771	51.4	-33.0	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
44773	59.1	-29.8	ALL	SPEED	SUR	1151	2	0	2.0	-0.3	2.0
44873	57.0	-31.2	ALL	SPEED	SUR	1	0	0	0.0	1.4	1.4
62552	58.7	-8.8	ALL	SPEED	SUR	640	0	0	2.3	-0.5	2.4
62553	51.9	-22.8	ALL	SPEED	SUR	560	0	0	2.4	-1.1	2.6
62558	52.8	-15.3	ALL	SPEED	SUR	3	2	67	0.0	1.2	1.2
62567	46.0	-12.9	ALL	SPEED	SUR	412	0	0	1.9	-0.5	1.9
62633	58.3	-34.2	ALL	SPEED	SUR	1	0	0	0.0	-1.4	1.4
62673	58.6	-33.9	ALL	SPEED	SUR	347	0	0	3.0	-4.3	5.3
62674	58.4	-29.0	ALL	SPEED	SUR	332	0	0	2.3	-5.5	5.9
62803	68.0	-61.8	ALL	SPEED	SUR	233	1	0	2.9	-7.3	7.9
WIND DIRECTION											
41505	20.4	-53.7	ALL	DIRN.	SUR	111	0	0	13.3	-15.3	20.3
41506	16.3	-57.1	ALL	DIRN.	SUR	158	0	0	17.0	8.9	19.2
41522	12.9	-52.1	ALL	DIRN.	SUR	132	0	0	17.5	6.7	18.8
41523	12.9	-54.7	ALL	DIRN.	SUR	165	0	0	13.2	-6.5	14.7
41524	14.3	-54.6	ALL	DIRN.	SUR	174	0	0	11.8	-15.3	19.3
42552	59.5	-7.5	ALL	DIRN.	SUR	1	0	0	0.0	5.0	5.0
44609	51.4	-35.1	ALL	DIRN.	SUR	533	113	21	48.6	5.6	48.9
44610	44.2	-47.1	ALL	DIRN.	SUR	258	0	0	30.5	-4.0	30.8
44621	54.1	-25.3	ALL	DIRN.	SUR	270	0	0	24.5	1.5	24.5
44624	62.8	-16.6	ALL	DIRN.	SUR	537	1	0	33.9	9.7	35.2
44742	39.7	-10.7	ALL	DIRN.	SUR	294	0	0	16.5	-8.4	18.5
44762	37.8	-11.0	ALL	DIRN.	SUR	195	0	0	16.2	-1.3	16.2
44771	51.4	-33.0	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
44773	59.1	-29.8	ALL	DIRN.	SUR	1061	2	0	30.5	0.2	30.5
44873	57.0	-31.2	ALL	DIRN.	SUR	1	0	0	0.0	-9.9	9.9
62552	58.7	-8.8	ALL	DIRN.	SUR	604	0	0	19.9	1.3	20.0
62553	51.9	-22.8	ALL	DIRN.	SUR	542	0	0	19.7	5.2	20.4
62558	52.8	-15.3	ALL	DIRN.	SUR	2	2	100	0.0	0.0	0.0
62567	46.0	-12.9	ALL	DIRN.	SUR	384	0	0	12.9	10.7	16.8
62673	58.6	-33.9	ALL	DIRN.	SUR	286	0	0	22.9	17.4	28.8
62674	58.4	-29.0	ALL	DIRN.	SUR	293	0	0	26.7	12.1	29.3
62803	68.0	-61.8	ALL	DIRN.	SUR	233	1	0	17.6	-10.2	20.3

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2721	0	1	1.7	0.1	2723	0	2	0	8.1	0.8
ACA	972	0	1	1.9	0.0	988	0	2	0	6.9	0.9
AEA	179	1	100	2.2	0.0	183	1	15	0	9.2	2.3
AEL	327	0	3	1.8	-0.2	330	0	4	0	9.9	1.0
AEY	35	3	3	1.9	0.8	35	0	0	0	8.0	0.6
AFL	234	1	2	1.8	-0.1	244	0	3	0	8.7	1.1
AFR	1067	0	12	1.9	0.3	1089	0	13	0	8.5	0.8
AIH	142	1	3	1.9	0.6	139	0	3	0	7.7	0.6
AJM	48	2	6	1.5	0.3	45	0	9	0	10.1	-0.2
AMX	155	0	6	2.0	0.3	155	1	9	0	12.4	0.5
ANZ	173	0	1	1.6	-0.7	176	0	1	0	6.0	0.4
AOM	278	0	3	1.8	0.8	283	1	5	0	8.8	1.1
AUA	45	0	7	1.8	-0.4	46	0	7	0	10.9	3.2
AVA	120	3	7	2.4	0.3	123	1	6	0	10.9	0.9
AZA	280	1	9	2.1	0.2	284	0	7	0	8.2	1.2
BAL	309	0	10	2.0	-0.2	321	0	13	0	8.4	1.6
BAW	1129	1	10	1.9	0.2	1132	0	11	0	8.1	1.5
BBC	22	5	5	1.8	1.1	22	5	9	0	8.1	0.8
BWA	91	0	100	2.1	1.2	96	0	3	0	9.4	0.3
CDN	437	0	2	2.0	0.9	436	0	3	1	7.7	0.8
CFG	534	0	3	2.0	-0.4	548	1	4	0	9.6	1.2
CKT	86	2	7	1.9	0.4	88	1	6	0	7.8	0.8
CLX	199	1	1	1.8	-0.3	206	0	4	0	8.2	1.1
CMM	53	0	0	1.5	0.2	50	0	6	0	9.8	-0.1
COA	754	0	3	2.1	0.4	763	0	9	0	12.5	3.4
CRL	215	1	1	1.6	0.5	219	0	1	0	9.7	0.7
CTB	153	1	2	1.7	0.1	156	1	2	0	6.9	1.1
CTM	30	0	17	1.6	-0.7	31	0	19	0	8.2	3.3
CUB	209	0	4	2.1	1.3	206	0	100	0	9.7	2.3
DAL	2156	0	2	1.9	-0.1	2173	0	3	0	8.2	0.8
DBY	73	0	3	2.0	-0.3	76	0	3	0	9.3	1.2
DHL	193	0	100	3.5	-2.1	192	0	100	1	10.7	1.4
DLH	1738	0	9	1.7	0.2	1756	0	13	3	7.3	0.9
ELY	119	2	8	1.7	0.2	117	0	9	1	8.0	0.8
EWW	86	0	100	2.8	0.6	84	0	100	0	13.8	2.8
FDX	358	1	3	1.9	0.7	361	0	2	0	9.1	0.6
FIN	291	0	4	1.8	0.5	294	1	7	1	8.2	0.7
GAF	23	0	0	2.7	0.0	23	0	4	0	9.0	3.1
HLF	83	1	6	2.0	-0.2	83	0	5	0	7.9	1.3
IBE	746	1	18	2.3	0.7	759	1	18	0	10.0	1.2
ICE	630	0	1	1.7	0.1	620	0	2	1	6.0	0.3
JAL	20	0	5	2.1	0.5	21	0	10	0	9.7	1.7
KLM	1889	0	1	1.7	0.2	1913	0	2	0	7.8	0.9
LDA	161	1	16	1.9	-1.0	165	0	18	0	10.5	1.2
LDI	341	0	20	1.9	0.0	342	0	22	0	8.6	0.2
LEI	115	0	0	1.8	0.2	114	1	4	0	8.7	1.4
LIB	117	1	3	2.2	1.1	120	1	7	0	10.0	-0.2
LOT	142	1	4	2.0	-1.1	143	0	2	0	7.5	1.5
LTU	471	1	3	1.7	0.3	484	0	4	0	8.5	1.4
MON	26	4	8	1.2	0.5	26	0	8	0	10.9	-0.5
MPD	27	0	0	2.2	0.6	27	4	11	0	11.5	1.0
MPH	442	0	2	1.9	-0.7	455	0	2	0	8.7	0.8
NWA	1842	1	2	2.2	0.9	1870	0	2	0	8.3	0.9
PAC	32	0	9	2.2	0.4	33	0	6	0	9.9	1.4
RAM	40	3	3	2.0	-0.9	40	0	0	0	8.8	3.6
RCH	123	2	100	2.0	0.3	123	1	100	0	10.0	0.9
RJA	30	0	0	1.8	0.8	30	0	3	3	4.8	-0.9
RRR	93	2	16	1.9	0.5	96	0	15	0	10.0	-0.7
SAB	29	0	0	1.2	0.2	30	0	0	0	6.0	2.6

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SAS	837	0	1	1.8	0.2	838	0	2	1	7.3	0.5
SIA	69	0	3	2.4	-0.9	77	0	9	0	8.3	0.5
SLR	65	0	20	1.9	-0.1	68	0	65	0	8.7	1.6
SPP	83	37	61	5.5	3.4	80	3	11	0	13.1	2.4
SVA	115	0	4	2.3	0.0	125	0	100	0	13.4	3.5
SWR	110	0	3	1.8	0.3	114	0	5	1	8.0	1.8
TAP	220	0	4	1.7	-0.2	217	1	6	0	9.5	1.4
TOW	90	1	7	2.1	-0.3	89	0	10	0	11.1	1.8
TSC	24	0	8	1.9	0.5	23	0	4	0	5.6	-0.4
TWA	1063	0	2	2.1	0.0	1056	0	4	0	8.8	1.1
UAL	1501	0	1	1.9	-0.1	1521	0	1	0	6.8	0.6
UNS	114	0	75	1.4	0.5	114	0	75	0	6.9	0.9
UPS	309	0	15	1.7	0.1	306	0	19	0	9.8	1.2
USA	183	0	0	1.9	0.2	185	0	6	0	13.6	2.5
VIR	215	0	0	1.9	-0.3	222	0	3	1	8.4	1.3
VKG	48	0	2	1.7	1.2	50	0	6	0	10.3	1.7
AR	23	9	43	2.2	1.7	23	0	39	0	9.6	5.2
BA	4187	1	2	1.6	0.3	4186	0	2	0	8.2	1.1
KL	2874	0	1	1.6	0.9	2871	0	0	0	7.1	1.0
LH	407	0	1	1.5	0.3	407	0	2	0	7.0	0.7
N	219	0	5	2.9	1.2	223	0	2	0	8.0	0.7
ADS	109	0	0	1.5	-0.4	109	0	6	0	5.2	1.3
US ACARS	9456	0	0	1.6	0.4	9454	0	0	0	7.2	1.0

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
FNOR	00	Z	100	10	0	18.5	33.1	27.4
FNOR	12	Z	100	9	0	11.1	23.7	20.9
FNOU	00	Z	100	10	0	19.5	24.5	14.8
FNOU	12	Z	100	9	0	6.6	17.2	15.9
FNPH	00	Z	100	7	0	31.3	34.2	13.9
FNPH	12	Z	100	10	0	11.3	12.1	4.2
FNRS	00	Z	100	6	0	11.6	11.7	-1.7
FNRS	12	Z	100	8	0	16.2	18.7	9.5
JBOA	00	Z	100	1	0	0.0	43.0	43.0
JIVB	00	Z	100	1	0	0.0	51.0	51.0
LDWR	00	Z	100	20	0	17.0	20.7	-11.8
LDWR	12	Z	100	21	0	14.2	15.9	-7.3
OVYA2	00	Z	100	8	0	16.1	16.3	2.9
OVYA2	12	Z	100	7	0	23.5	24.7	7.6
SHIPAF	00	Z	100	1	0	0.0	6.0	6.0
SHIPAF	12	Z	100	1	0	0.0	25.0	25.0
SHIPBX	00	Z	100	1	0	0.0	30.0	30.0
SHIPS	00	Z	100	1	0	0.0	30.0	30.0
SHPAF	00	Z	100	1	0	0.0	22.0	22.0
V2/M	00	Z	100	1	0	0.0	30.0	-30.0
V2VM	00	Z	100	12	0	14.6	14.8	-1.9
V2VM	12	Z	100	10	0	15.0	15.2	2.3
V2XM	00	Z	100	7	0	18.2	21.3	11.0
V2XM	12	Z	100	5	0	18.8	19.1	3.6
WTEC	00	Z	100	10	0	19.0	19.8	5.6
WTEC	12	Z	100	7	0	20.5	21.3	-5.6
WTEU	00	Z	100	1	0	0.0	9.0	9.0
03953	00	Z	100	22	0	26.8	27.6	-6.9
03953	12	Z	100	21	0	19.3	19.5	3.0
04018	00	Z	100	22	0	11.9	13.4	6.2
04018	12	Z	100	22	0	10.7	14.0	9.1
04220	00	Z	100	22	0	14.7	20.5	14.3
04220	12	Z	100	21	0	15.1	21.8	15.7
04270	00	Z	100	22	0	14.0	14.1	2.0
04270	12	Z	100	21	0	10.5	10.8	2.5
04339	00	Z	100	18	0	22.5	23.5	6.9
04339	12	Z	100	19	0	18.9	20.5	7.9
04360	00	Z	100	21	0	17.9	21.2	11.4
04360	12	Z	100	22	0	16.5	20.7	12.5
08001	00	Z	100	22	0	22.8	24.9	-10.0
08001	12	Z	100	21	0	21.0	22.3	-7.3
08508	00	Z	100	20	0	13.5	14.5	5.4
08508	12	Z	100	21	0	16.4	27.0	21.5
08522	00	Z	100	1	0	0.0	14.0	14.0
08522	12	Z	100	3	0	3.9	24.0	23.7
60020	00	Z	100	17	1	12.9	12.9	-1.1
60020	12	Z	100	21	0	16.8	17.4	-4.8
71600	00	Z	100	21	0	19.1	25.1	16.2
71600	12	Z	100	22	0	14.2	19.7	13.6
72201	00	Z	100	19	0	17.7	17.9	2.8
72201	12	Z	100	22	0	17.3	19.8	-9.6
72402	00	Z	100	17	0	31.4	32.1	-6.6
72402	12	Z	100	21	0	25.9	27.8	-10.1
74494	00	Z	100	17	0	15.6	15.7	1.8
74494	12	Z	100	19	0	13.9	15.2	-6.1
78016	00	Z	100	1	0	0.0	3.0	3.0
78016	12	Z	100	18	0	17.2	18.8	7.6

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
FNOR	00	Z	500	11	0	11.0	15.4	10.8
FNOR	12	Z	500	12	0	14.8	19.2	12.3
FNOU	00	Z	500	11	0	15.5	19.9	12.5
FNOU	12	Z	500	9	0	14.2	16.8	8.9
FNPH	00	Z	500	7	0	36.5	40.4	17.3
FNPH	12	Z	500	10	0	10.7	15.8	11.6
FNRS	00	Z	500	7	0	13.9	17.9	11.3
FNRS	12	Z	500	8	0	17.1	20.1	10.6
JBOA	00	Z	500	1	0	0.0	5.0	-5.0
JIVB	00	Z	500	1	0	0.0	9.0	9.0
LDWR	00	Z	500	20	0	13.6	14.3	4.3
LDWR	12	Z	500	20	0	9.7	9.7	-0.3
OVYA2	00	Z	500	9	0	13.7	15.6	7.3
OVYA2	12	Z	500	8	0	9.9	9.9	0.8
SHIPAF	00	Z	500	1	0	0.0	16.0	16.0
SHIPAF	12	Z	500	1	0	0.0	4.0	4.0
SHIPBX	00	Z	500	1	0	0.0	5.0	5.0
SHIPS	00	Z	500	1	0	0.0	5.0	5.0
SHPAF	00	Z	500	1	0	0.0	21.0	21.0
V2/M	00	Z	500	1	0	0.0	17.0	-17.0
V2VM	00	Z	500	12	0	19.3	20.1	-5.3
V2VM	12	Z	500	10	0	18.0	19.4	-7.3
V2XM	00	Z	500	8	0	17.6	20.1	9.8
V2XM	12	Z	500	5	0	22.0	23.4	8.2
WTEC	00	Z	500	10	0	8.0	8.2	1.8
WTEC	12	Z	500	10	0	22.6	23.0	-4.2
WTEU	00	Z	500	1	0	0.0	6.0	-6.0
03953	00	Z	500	22	0	25.9	27.9	10.5
03953	12	Z	500	22	0	20.0	20.1	1.1
04018	00	Z	500	22	0	14.0	16.8	9.4
04018	12	Z	500	22	0	7.9	12.5	9.7
04220	00	Z	500	22	0	18.3	19.6	7.1
04220	12	Z	500	21	0	12.5	14.4	7.0
04270	00	Z	500	22	0	16.8	18.4	7.5
04270	12	Z	500	21	0	12.4	14.5	7.6
04339	00	Z	500	21	0	19.3	19.7	4.0
04339	12	Z	500	19	0	11.4	16.4	11.7
04360	00	Z	500	21	0	20.3	21.9	8.3
04360	12	Z	500	22	0	11.8	13.1	5.7
08001	00	Z	500	22	0	20.7	21.7	6.5
08001	12	Z	500	22	0	16.8	16.8	-1.1
08508	00	Z	500	22	0	12.7	17.4	12.0
08508	12	Z	500	22	0	13.3	23.9	19.9
08522	00	Z	500	1	0	0.0	26.0	26.0
08522	12	Z	500	3	0	10.0	18.0	15.0
60020	00	Z	500	19	0	12.0	12.3	2.7
60020	12	Z	500	21	0	13.6	15.4	7.2
71600	00	Z	500	21	0	11.0	14.1	8.8
71600	12	Z	500	22	0	11.1	12.2	5.0
72201	00	Z	500	20	0	6.5	8.3	5.1
72201	12	Z	500	22	0	12.2	12.8	-4.1
72402	00	Z	500	20	0	12.3	18.2	-13.5
72402	12	Z	500	21	0	19.8	27.9	-19.6
74494	00	Z	500	21	0	12.5	12.5	0.6
74494	12	Z	500	22	0	10.4	10.7	-2.8
78016	00	Z	500	1	0	0.0	5.0	5.0
78016	12	Z	500	19	0	13.9	18.4	12.0

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
FNOR	00	V	100	9	0	0	1.7	0.7	0.1
FNOR	12	V	100	6	0	0	4.6	0.9	3.8
FNOU	00	V	100	7	0	0	4.6	-1.9	-0.6
FNOU	12	V	100	7	0	0	4.6	-0.9	-0.3
FNPH	00	V	100	5	0	0	4.6	0.2	1.7
FNPH	12	V	100	9	0	0	4.6	0.4	-0.1
FNRS	00	V	100	3	0	0	4.6	0.4	1.8
FNRS	12	V	100	6	0	0	4.6	-2.3	-1.4
JBOA	00	V	100	1	0	0	4.6	0.4	7.0
JIVB	00	V	100	1	0	0	4.6	1.4	3.8
LDWR	00	V	100	20	0	0	4.6	0.1	0.2
LDWR	12	V	100	21	0	0	3.0	-0.1	0.0
OVYA2	00	V	100	8	0	0	3.0	0.1	-0.2
OVYA2	12	V	100	6	0	0	3.0	-0.1	-0.1
SHPAF	00	V	100	1	0	0	3.0	-0.5	-1.4
V2VM	00	V	100	11	0	0	3.0	1.9	-1.2
V2VM	12	V	100	9	0	0	4.3	0.7	1.6
V2XM	00	V	100	6	0	0	4.3	-1.0	-0.2
V2XM	12	V	100	5	0	0	4.3	-0.8	1.1
WTEC	00	V	100	3	0	0	4.3	0.8	-3.0
WTEC	12	V	100	1	0	0	4.3	7.0	9.1
03953	00	V	100	22	0	0	3.3	-1.5	0.2
03953	12	V	100	19	0	0	2.4	-1.2	-0.3
04018	00	V	100	21	0	0	3.5	-0.2	-0.5
04018	12	V	100	22	0	0	2.9	-0.2	0.0
04220	00	V	100	20	0	0	2.6	-0.5	1.8
04220	12	V	100	17	0	0	2.5	0.7	1.9
04270	00	V	100	16	0	0	2.9	-0.4	0.5
04270	12	V	100	19	0	0	2.7	-0.4	0.4
04339	00	V	100	16	0	0	2.5	0.1	-0.3
04339	12	V	100	19	0	0	4.3	1.5	-0.3
04360	00	V	100	18	0	0	3.3	0.6	-0.9
04360	12	V	100	21	0	0	2.3	0.9	-0.4
08001	00	V	100	22	0	0	4.3	0.0	1.1
08001	12	V	100	19	0	0	5.5	-2.4	0.2
08508	00	V	100	16	0	0	3.0	1.1	0.1
08508	12	V	100	12	0	0	3.8	3.7	-0.5
60020	00	V	100	14	0	0	5.5	1.3	2.9
60020	12	V	100	21	0	0	5.3	-0.9	1.3
71600	00	V	100	21	0	0	3.5	-0.5	-0.5
71600	12	V	100	22	0	0	2.5	1.2	-1.2
72201	00	V	100	19	0	0	3.2	1.7	1.1
72201	12	V	100	22	0	0	4.9	-1.1	0.9
72402	00	V	100	17	0	0	3.2	1.2	-0.6
72402	12	V	100	21	0	0	5.9	-0.8	0.0
74494	00	V	100	17	0	0	3.1	-1.3	0.4
74494	12	V	100	18	0	0	3.3	-0.2	1.6
78016	00	V	100	1	0	0	8.9	2.6	9.6
78016	12	V	100	18	0	0	8.9	-0.7	-1.2

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS: Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
FNOR	00	V	500	11	0	0	4.5	-1.9	0.6
FNOR	12	V	500	12	0	0	3.7	-2.9	1.5
FNOU	00	V	500	9	0	0	4.7	0.9	-0.3
FNOU	12	V	500	9	0	0	3.2	-0.3	-0.9
FNPH	00	V	500	6	0	0	3.2	-0.2	-0.4
FNPH	12	V	500	9	0	0	3.2	-1.0	-1.2
FNRS	00	V	500	7	0	0	3.2	-2.6	0.4
FNRS	12	V	500	8	0	0	3.2	-3.2	-0.5
JBOA	00	V	500	1	0	0	3.2	6.6	3.7
JIVB	00	V	500	1	0	0	3.2	0.9	0.6
LDWR	00	V	500	20	0	0	3.2	-0.7	-1.0
LDWR	12	V	500	20	0	0	3.2	0.1	-0.1
OVYA2	00	V	500	9	0	0	3.0	-0.5	-0.2
OVYA2	12	V	500	7	0	0	3.0	0.2	-0.3
SHPAF	00	V	500	1	0	0	3.0	1.9	1.4
V2/M	00	V	500	1	0	0	3.0	-2.2	-0.1
V2VM	00	V	500	11	0	0	3.0	-0.3	-1.7
V2VM	12	V	500	10	0	0	2.8	-0.1	-1.3
V2XM	00	V	500	6	0	0	2.2	-0.3	0.0
V2XM	12	V	500	5	0	0	2.2	2.2	0.9
WTEC	00	V	500	2	1	33	2.2	-15.8	-18.2
WTEC	12	V	500	4	0	0	2.2	-3.1	0.9
03953	00	V	500	22	0	0	4.0	1.8	0.4
03953	12	V	500	22	0	0	5.2	0.4	-0.2
04018	00	V	500	20	0	0	3.7	0.9	0.5
04018	12	V	500	21	0	0	2.5	1.3	0.4
04220	00	V	500	20	0	0	3.7	1.8	1.8
04220	12	V	500	17	0	0	4.1	0.8	0.9
04270	00	V	500	20	0	0	4.0	0.9	0.2
04270	12	V	500	20	0	0	4.0	0.5	0.2
04339	00	V	500	19	0	5	4.1	-0.3	-3.0
04339	12	V	500	19	0	0	7.1	0.5	-1.2
04360	00	V	500	20	0	0	3.5	-0.4	-0.6
04360	12	V	500	21	0	0	4.3	-0.1	-0.3
08001	00	V	500	22	0	4	4.0	-0.9	-1.8
08001	12	V	500	21	0	0	5.3	-0.1	-0.4
08508	00	V	500	18	0	0	2.7	-0.4	-0.2
08508	12	V	500	10	0	0	4.0	-0.3	1.1
60020	00	V	500	18	0	0	4.0	-2.1	0.2
60020	12	V	500	21	0	0	5.0	-0.9	-0.7
71600	00	V	500	21	0	0	4.6	-0.6	0.5
71600	12	V	500	22	0	0	3.5	2.2	1.7
72201	00	V	500	20	0	0	3.8	0.4	0.9
72201	12	V	500	22	0	0	2.6	0.2	1.0
72402	00	V	500	20	0	0	3.2	0.8	1.6
72402	12	V	500	21	0	0	4.0	0.2	1.7
74494	00	V	500	21	0	0	3.0	-1.3	0.0
74494	12	V	500	22	0	0	3.0	-0.5	1.3
78016	00	V	500	1	0	0	8.1	-1.4	7.6
78016	12	V	500	19	0	0	8.1	0.2	1.4

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45